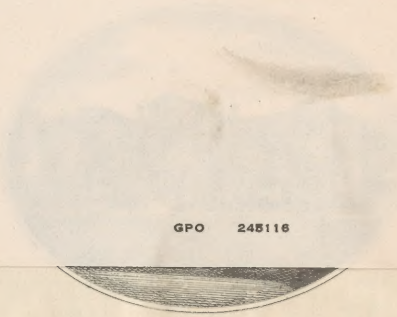
California. State Department
of Public Health

Control of Communicable Disease in California



GPO 245116

WASHINGTON, D.C.

A MANUAL FOR THE

Control of Communicable Diseases in California

Compiled by

CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH

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FOREWORD

An attempt has been made in this volume to fill a need expressed by many public health workers in California for a manual of approved procedures for the control of communicable diseases.

Grateful acknowledgment is made to the American Public Health Association for permitting extensive use of material contained in its report, "The Control of Communicable Diseases," 6th edition, 1945. The text of this publication was used in its original form wherever possible, and revision or substitution was made chiefly where necessary to bring it into conformity with existing California regulations and statutes.

Supplemental information on the laboratory diagnosis of the communicable diseases, listing the diagnostic tests available through the State Department of Public Health, has been added, and the immunization procedures have been expanded to include the specific procedures recommended by the Department. The use of sulfonamides and antibiotics has been added wherever a response could be expected.

Also included is a section directed specifically to the public health nurse, whose part in carrying out the general control measures is an important one. The sections from the Health and Safety Code which are most often referred to for the enforcement of control measures have been incorporated as an aid to easy reference.

It is hoped that the manual will prove of value to all persons engaged in the control of communicable disease and particularly to the staffs of local health departments. In preparation of a manual such as this, errors and omissions may occur. Members of the department will be grateful for mention of these as well as for expressions of criticism based on experience.

Wilton L. Halverson M.D.

Director of Public Health

PROVISIONS OF THE STATE HEALTH AND SAFETY CODE FOR QUARANTINE OF COMMUNICABLE DISEASES

(Division 3, Chapter 6)

Article 1. Definitions

2500. "Health officer," as used in this chapter, includes county, town, city, and district health officers, and city and district health boards, but does not include advisory health boards. "Health Officer"

Article 2. Functions of State Department

2521. The state department may establish and maintain places of quarantine or isolation. Places of quarantine

2522. The state department may quarantine, isolate, inspect, and disinfect persons, animals, houses, rooms, other property, places, cities, or localities, whenever in its judgment such action is necessary to protect or preserve the public health. Persons and objects

2523. The state department may destroy bedding, carpets, household goods, furnishings, materials, clothing, or animals, which, in its judgment, are an imminent menace to the public health. Destruction of objects

2524. Upon being informed by a health officer of any contagious, infectious, or communicable disease the state department may take such measures as are necessary to ascertain the nature of the disease and prevent its spread. To that end, the state department may, if it considers it proper, take possession or control of the body of any living persons, or the corpse of any deceased person. Additional measures

Article 3. Functions of Health Officers

2554. Each health officer and coroner, knowing or having reason to believe that any case of cholera, plague, yellow fever, malaria, leprosy, diphtheria, scarlet fever, smallpox, typhus fever, typhoid fever, paratyphoid fever, anthrax, glanders, epidemic cerebrospinal meningitis, tuberculosis, pneumonia, dysentery, erysipelas, uncinariasis or hookworm, trachoma, dengue, tetanus, measles, German measles, chickenpox, whooping cough, mumps, pellagra, beriberi, Rocky Mountain spotted (or tick) fever, syphilis, gonococcus infection, rabies, poliomyelitis, or any other contagious or infectious disease exists, or has recently existed, within the territory under his jurisdiction, shall take such measures as may be necessary to prevent the spread of the disease. Duty to prevent spread of certain diseases

Enforcement of laws and rules

2555. Every health officer shall enforce all orders, rules, and regulations concerning quarantine prescribed or directed by the state department.

Places of quarantine

2556. Each health officer, whenever required by the state department, shall establish and maintain places of quarantine or isolation that shall be subject to the special direction of the state department.

Quarantine against another city or county

2557. No quarantine shall be established by a county or city against another county or city without the written consent of the state department.

Instructions of state department

2558. Whenever in the judgment of the state department it is necessary for the protection or preservation of the public health, each health officer shall, when directed by the state department, do the following:

(a) Quarantine and disinfect persons, animals, houses or rooms, in accordance with general and specific instructions of the state department.

(b) Destroy bedding, carpets, household goods, furnishings, materials, clothing, or animals, when ordinary means of disinfection are considered unsafe, and when the property is, in the judgment of the state department, an imminent menace to the public health.

Compensation for destroyed property

When property is destroyed pursuant to this section, the governing body of the locality in which the destruction occurs may make adequate provision for compensation in proper cases for those injured thereby.

Quarantine

2559. Upon receiving information of the existence of: Asiatic cholera, yellow fever, typhus fever, plague, smallpox, diphtheria, or any other contagious, infectious, or communicable disease that the state department may from time to time declare quarantinable, each health officer shall:

(a) Quarantine each case.

(b) Follow local rules and regulations, and all general and special rules, regulations, and orders of the state department, in carrying out the quarantine.

Tuberculosis quarantine

2559.5. Upon receiving information of the existence of tuberculosis, each health officer shall:

(a) Quarantine or isolate each case, whenever such a step is necessary for the preservation and protection of the public.

(b) Follow local rules and regulations, and all general and special rules, regulations, and orders of the state department in carrying out such quarantine or isolation.

(Added by Stats 1945, Ch. 221.)

Report of quarantine

2560. Each health officer who establishes any quarantine shall promptly transmit to the state department a copy of all quarantine rules, orders, and regulations, and of all subsequent changes in the quarantine adopted by him.

Notice of quarantine

2561. When all or any part of a building, house, structure, tent, or other place is quarantined because of a contagious, infectious, or communicable disease, the health officer shall fasten firmly on its most conspicuous part a yellow placard, upon which shall be printed the following words:

"Keep out. These premises have been quarantined by order of the ————. Note—Under the provisions of the Health and Safety Code of the State of California anyone entering or leaving these premises without the permission of the health officer is guilty of a misdemeanor."

The word "Quarantined" shall be printed in plain and legible letters at least two and one-half inches in height.

The placard shall not be removed except by the health officer, nor shall it be defaced or obscured.

Quarantine rules

2562. When quarantine is established by a health officer, all persons shall obey his rules, orders, and regulations.

Obedience to quarantine

2563. A person subject to quarantine, residing or in a quarantined building, house, structure, or tent, shall not go beyond the lot upon which the building, house, structure or tent is situated, nor put himself in immediate communication with any person not subject to quarantine, other than the health officer and the physician. The health officer maintaining the quarantine shall appoint, or have appointed, a suitable person to perform necessary outside services for the necessary wants of the persons quarantined. The person appointed shall not enter the building, house, structure, or tent, nor shall he come in personal contact with any of the persons quarantined. He shall leave at the entrance of the building, house, structure, or tent, or at such other place as may be designated by the health officer, all articles that he may bring thereto. He shall strictly observe the orders of the health officer.

Exclusion of diseased person from school

2564. No instructor, teacher, pupil, or child affected with any contagious, infectious, or communicable disease that is quarantined, or that is subject to being quarantined or reported, or who resides in any house, building, structure, tent, or other place where the disease exists or has recently existed, shall be permitted by any superintendent, principal, or teacher of any college, seminary, or public or private school to attend the college, seminary, or school, except by the written permission of the health officer.

Disinfection

2565. No quarantine shall be raised until every exposed room, together with all personal property in the room, has been thoroughly disinfected, or, if necessary, destroyed, by or under the direction of the health officer; and until all persons quarantined have taken a thorough antiseptic bath and have put on clothing free from contagion.

Removal of milk bottles from quarantined area

2566. No milk man shall remove milk bottles or other receptacles for milk from any building, house, structure, tent, or other place in which a contagious, infectious, or communicable disease exists or has existed, nor from any place

within any quarantined district, nor at any time after a quarantine has been removed, without the written permission of the health officer; and until the milk bottles or other receptacles have been disinfected and cleaned to the satisfaction of that officer.

Person from quarantined area not to deal in milk

2567. It is unlawful for any milkman, milk dealer, or milk distributor in whose house any case of cholera, typhus fever, plague, scarlet fever, diphtheria, membranous croup, leprosy, anthrax, glanders, cerebro-spinal meningitis, whooping cough, typhoid fever, dysentery, trachoma, or tetanus exists, to continue the sale or distribution of milk until the health officer has appointed, at the expense of the county where the milkman, dealer, or distributor lives, a person to superintend his dairy, or other place where or from which he sells, delivers, or distributes milk, and all his cows, bottles, vessels, and milk utensils. The person appointed shall strictly require that any person attending to the cows, dairy, sheds, milk cans, bottles, vessels, and milk utensils, shall not have access to, nor have any communication with the persons who reside in, the infected house, except with the permission and under the inspection of the health officer.

Reports

2568. In case of a local epidemic of disease, the health officer shall report at such times as are requested by the state department all facts concerning the disease, and the measures taken to abate and prevent its spread.

Telegraphic reports

2569. Each health officer shall immediately report by telegraph to the state department every discovered or known case of plague, Asiatic cholera, yellow fever, or typhus fever. Within 24 hours after investigation he shall report the cause, source, and extent of contagion and infection, and all acts done and measures adopted. He shall also make such further reports as the state department may require.

Report of new cases

2570. Each health officer placing any case under quarantine shall, within 24 hours thereafter, report it fully, in writing, to the state department.

Reportable diseases

2571. The following shall be properly reported in writing to the state department by the health officer:

Chickenpox, erysipelas, pneumonia, epilepsy, epidemic cerebro-spinal meningitis, trachoma, whooping cough, mumps, dengue, dysentery, tuberculosis, typhoid fever, tetanus, malaria, leprosy, measles, glanders and anthrax affecting human beings, rabies, syphilis, gonococcus infection, poliomyelitis, and other disease which appears to have become epidemic.

This list of reportable disease may be changed at any time by the state department.

When to be quarantined

The diseases enumerated in this section, and such others as from time to time may be added by the state department, shall be quarantined whenever in the opinion of the state department that action is necessary for the protection of the public health, and shall be isolated whenever in the opinion

of the department or health officer, isolation is necessary for the protection of the public health.

(Amended by Stats. 1939, Ch. 375.)

Written report

2572. Each health officer, other than a county health officer, in the county shall transmit to the county health officer at least weekly in writing a report showing the number and character of infectious, contagious, or communicable disease reported, and their location.

Report to health officer

2573. All physicians, nurses, clergymen, attendants, owners, proprietors, managers, employees, and persons living, or visiting any sick person, in any hotel, lodging house, house, building, office, structure, or other place where any person is ill of any infectious, contagious, or communicable disease, shall promptly report that fact to the health officer, together with the name of the person, if known, the place where he is confined, and the nature of the disease, if known.

Application of sections to quarantine

2574. Unless otherwise directed by the state department, Sections 2559, 2561 to 2563, inclusive, 2565 to 2567, inclusive, and 2569 to 2571, inclusive, of this chapter shall be strictly observed in all cases of quarantine.

Article 4. Violations

Penalty for violation of rule

2600. Any person who, after notice, violates, or who, upon the demand of any health officer, refuses or neglects to conform to, any rule, order, or regulation prescribed by the state department respecting a quarantine or disinfection of persons, animals, things, or places, is guilty of a misdemeanor.

Willful exposure

2601. Except in the case of the removal of an afflicted person in a manner the least dangerous to the public health, any person afflicted with any contagious, infectious, or communicable disease who willfully exposes himself; and any person who willfully exposes another person afflicted with such disease in any public place or thoroughfare is guilty of a misdemeanor.

Penalty

2602. Any person who violates any section in Article 3 of this chapter, with the exception of 2555, is guilty of a misdemeanor, punishable by a fine of not less than twenty-five dollars ($25) nor more than five hundred dollars ($500), or by imprisonment for a term of not more than 90 days, or by both. He is guilty of a separate offense for each day that the violation continues.

REGULATIONS OF THE CALIFORNIA STATE BOARD OF PUBLIC HEALTH FOR THE CONTROL OF COMMUNICABLE DISEASE

(General Sections)

Notification

SECTION 2500. It shall be the duty of every physician or practitioner, every superintendent or manager of a dispensary, hospital, or clinic, or any person in attendance on a case of a reportable disease or a case suspected of being a reportable disease, to report the case immediately upon the proper form provided for that purpose by the State Department of Public Health, to the local health authority, who shall in turn report at least weekly, on the prescribed form, to the Director of the State Department of Public Health, all cases so reported to him. The following diseases constitute "reportable diseases" within the intent of these regulations:

Amebiasis (Amoebic Dysentery)
Anthrax
Botulism
Chancroid
Chickenpox (Varicella)
Cholera, Asiatic
Coccidioidal Granuloma
Conjunctivitis, Acute Infectious of the Newborn (Gonorrheal Ophthalmia, Ophthalmia Neonatorum, and Babies' Sore Eyes in the first 21 days of life)
Dengue
Diarrhea of the Newborn
Diphtheria
Dysentery, Bacillary
Encephalitis, Infectious
Epilepsy
Food Poisoning
German Measles (Rubella)
Glanders
Gonococcus Infection
Granuloma Inguinale
Hepatitis, Infectious (Infectious Jaundice)
Icterohemorrhagic Spirochetosis (Weil's Disease)
Influenza, Epidemic
Leprosy
Lymphogranuloma Venereum, (Lymphopathia Venereum, Lymphogranuloma Inguinale)
Malaria
Measles (Rubeola)
Meningococcic Infections
Mumps (Parotitis)
Paratyphoid Fever, A, B, and C
Plague
Pneumonia, Infectious
Poliomyelitis, Acute Anterior
Psittacosis
Rabies, Human and Animal
Relapsing Fever
Rheumatic Fever
Rocky Mountain Spotted Fever
Scarlet Fever (see Streptococcal Infections, Respiratory)
Smallpox (Variola)
Streptococcal Infections, Respiratory (including Scarlet Fever, Streptococcic Sore Throat, Streptococcic Nasopharyngitis and "Septic Sore Throat")
Syphilis
Tetanus
Trachoma
Trichinosis
Tuberculosis
Tularemia
Typhoid Fever
Typhus Fever
Undulant Fever (Brucellosis)
Whooping Cough (Pertussis)
Yellow Fever

This list of reportable diseases may be changed at any time by the State Board of Public Health (Section 2571, Art. 3, Ch. 6, Health and Safety Code).

SECTION 2502. Cases of Asiatic cholera, plague, typhus (louse borne epidemic type), and yellow fever are to be reported to the Director of the State Department of Public Health immediately by telephone or telegraph. (See Section 2569, Ch. 6, Art. 3, Health and Safety Code).

SECTION 2504. When no physician is in attendance, it shall be the duty of any individual having knowledge of a person suffering from a disease presumably communicable or suspected of being communicable to report forthwith to the local health officer all the facts relating to the case, together with the name and address of the person.

Reporting by schools

SECTION 2508. It shall be the duty of anyone in charge of a public or private school, kindergarten, boarding school, or day nursery to report at once to the local health officer the presence or suspected presence of any of the reportable diseases.

Outbreaks of non-reportable diseases

SECTION 2510. The local health officer or anyone having knowledge of any undue prevalence of Vincent's infection, scabies, impetigo, hookworm, epidemic keratoconjunctivitis, or other diseases shall report such facts to the Director of the State Department of Public Health at once.

Investigation of the case

SECTION 2512. Upon being notified of a case of communicable disease or a suspected case of communicable disease, the local health officer shall make an investigation to determine if the case is one of the communicable diseases. If he finds the case to be one of the communicable diseases, or suspects the case to be one of the communicable diseases, he shall take such steps as he deems necessary to prevent the spread of the disease to others and to determine the source of infection.

If the source of infection is found to be outside his jurisdiction, the health officer shall notify the health officer under whose jurisdiction the infection was probably contracted, and the Director of the State Department of Public Health.

Instructions to household

SECTION 2514. It shall be the duty of the physician in attendance on a case considered to be an infectious or communicable disease, to give detailed instructions to the members of the household in regard to precautionary measures to be taken for preventing the spread of the disease. Such instructions shall conform to the regulations of the State Department of Public Health and the ordinances in effect in the local community.

Isolation

SECTION 2516. If the disease is one requiring strict isolation, the health officer shall define the area within which the patient is to be isolated and issue instructions to the patient and members of the household regarding the measures to be taken to prevent the spread of the disease.

Diseases in this classification do not necessarily require quarantine of the premises, unless in the judgment of the local health officer such quarantine is necessary for the protection of the public.

Isolation may be defined as the use of recognized isolation techniques, sufficient to prevent the spread of the disease to non-infected persons, and shall include the following:

(a) The patient shall have a separate bed in a room screened against flies.

(b) All persons, except those caring for the patient, shall be excluded from the sick room.

(c) The persons caring for the patient shall avoid coming in contact with any other persons within the household or elsewhere until every precaution has been taken to prevent the spread of infectious material from the patient's room.

(d) The persons caring for the patient shall wear a washable outer garment and shall thoroughly wash their hands with soap and hot water after handling the patient or any object he may have contaminated. On leaving the room in which the patient is isolated, the attendant shall take off the washable outer garment and leave it in the room until disinfected.

(e) All discharges from the nose and mouth shall be burned or disinfected. The discharges should be received in pieces of soft tissue or cloth and dropped into a paper bag which can be burned.

(f) Objects which may have been contaminated by the patient shall be disinfected before being removed from the contaminated area.

(g) The feces and urine of patients suffering from diseases in which the infectious agent appears in the feces or urine shall be disposed of according to instructions given by the local health officer.

Modified isolation

SECTION 2518. If the local health officer, upon making the investigation prescribed in Section 2512, is satisfied that the case is one of the diseases in which only a modified isolation is required, or is very suggestive of a disease in which only a modified isolation is required, he shall define the area within which the case is to be isolated and issue instructions accordingly. The degree of isolation required will depend upon the disease and must be sufficient to prevent the spread of the disease to other members of the family and to the public. The local health officer shall determine the isolation technique required and issue instructions accordingly.

Quarantine

SECTION 2520. If the local health officer, upon making investigation, is satisfied that the case is one of the diseases or very suggestive of one of the diseases requiring isolation of the case, and quarantine of the premises, he shall: define the area within which the patient is to be isolated, define the quarantined area, and affix the specified placard in a conspicuous place at the principal entrance to the premises.

When isolation of the patient and quarantine of the premises are established, the health officer shall determine the contacts that are subject to quarantine and issue instructions accordingly.

The placard used for quarantine purposes shall conform to the specifications prescribed in Section 2561 of the Health and Safety Code.

Until removal of this placard is authorized by the local health officer, no unauthorized person shall enter or leave the premises or remove any article therefrom without the permission of the local health officer.

Observation

SECTION 2522. For the purposes of definition, the term "observation," as used in these regulations, shall refer to a frequent check upon the person under observation to determine whether such person is free of the disease for which he has been placed under observation, or has contracted the disease. Unless otherwise specified, it does not mean the isolation or quarantine of the individual.

Terminal disinfection

SECTION 2524. Each person released from quarantine or isolation shall bathe and wash his hair with soap and hot water and put on clean clothes. The area of isolation shall be disinfected under the supervision of the health officer. The disinfection shall be a thorough cleansing of the entire area of isolation and should consist in the scrubbing with soap and water of all floors, woodwork, and furniture. There is no necessity for washing ceilings or the upper parts of walls beyond the person's reach. Upholstered furniture, carpets, mattresses, and hangings should be exposed to direct sunlight for several days.

Exclusion by school authorities

SECTION 2526. It shall be the duty of the principal or other person in charge of any public, private or Sunday school to exclude therefrom, any child, or other person affected with a disease presumably communicable, until such child or other person shall have been seen by the school physician or nurse, or shall have presented a certificate issued by the local health officer, or by the attending physician and countersigned by the local health officer, stating that such child or other person is not liable to transmit a communicable disease.

Communicable disease on dairies

SECTION 2528. When a milk supply is thought to be the source of infection for any one of the communicable diseases known to be transmitted through or suspected of being transmitted through milk, the health officer shall prohibit the sale of such milk until such time as he deems it to be safe for human consumption.

When a case of typhoid fever, paratyphoid fever, bacillary dysentery, scarlet fever, diphtheria, or any other disease capable of being transmitted through milk is confined on the premises where a dairy is maintained, the health officer shall prohibit the sale of such milk until he is satisfied that such is safe for human consumption.

Public food handlers

SECTION 2530. No person known to be infected with a communicable disease or suspected of being infected with a communicable disease shall engage in the commercial handling

of food, or be employed on a dairy or on premises handling milk or milk products, until he is determined by the health officer to be free of such disease, or incapable of transmitting the infection. See Section 8, Food Sanitation Act.

Carriers

SECTION 2532. Any person known to be or suspected of being a carrier of any communicable disease shall be reported to the health officer and shall not be permitted to engage in any occupation or activity that would endanger other persons; and such carrier shall be placed in such a degree of isolation or quarantine as the health officer shall deem advisable.

Laboratory tests for the release of cases or carriers of communicable diseases

SECTION 2534. Whenever laboratory tests are required for the release of cases or carriers, the tests shall be taken by the health officer or his representatives and shall be submitted to a laboratory approved by the State Board of Public Health for such purposes. Specimens may be sent to laboratories not so approved, provided the specimens are divided and a portion of the specimens are sent to an approved laboratory. Release shall be considered on the basis of the report of the approved laboratory only.

Transportation of communicable diseases cases

SECTION 2536. No individual with a communicable disease nor any contact of a communicable disease case subject to isolation or quarantine, shall be transported from one place to another without the permission of the health officer, and no case may be transported outside the area of jurisdiction of the health officer, until the permission of the health officer into whose territory the case is being taken is obtained. When transportation involves travel through several counties, the permission as to the mode of travel shall be obtained from the State Department of Public Health.

Funerals

SECTION 2538. Funeral services for individuals who have died of a communicable disease shall be conducted under the supervision of the health officer. In quarantinable diseases and diseases requiring restriction of contacts, a public funeral service may be permitted only in those instances wherein the casket remains closed and, after suitable investigation, the health officer feels that the public is fully protected, in that there is complete segregation from the public of contacts and those exposed individuals who are subject to quarantine or isolation.

General clause

SECTION 2540. In addition to the requirements stipulated in these regulations, the local health authority shall, after suitable investigation, take such additional steps as he deems necessary to prevent the spread of communicable disease or a disease suspected of being communicable in order to protect the public health.

ACTINOMYCOSIS

Recognition of the disease

A local or general, acute or chronic suppurative process combined with growth of connective tissue, and characterized by the presence in the lesions of vegetations or colonies of the specific micro-organism, identifiable as "sulphur granules" and by microscopic examination of discharges from the lesions. It may be confused with pulmonary or generalized tuberculosis.

Etiologic agent

Actinomyces hominis and other species of this genus.

Source of infection

Unknown. Possibly in some cases of actinomycosis in man, *Actinomyces hominis* previously existed as a saprophyte in the oral cavity (carious teeth, interstices between teeth, and crypts of tonsils).

Mode of transmission

Among cattle, principally by grains, grasses, and other cattle fodder, and stable bedding contaminated by discharges from lesions of the disease, infecting abrasions or wounds of oral cavity or body surface. It is not probable that the disease is transmitted from man to man. It may be transmitted from animal to man, but only rarely and indirectly through infection of oral or skin wounds by contaminated materials. The disease sometimes follows extraction of carious or broken teeth, or accidental injury, particularly to the jaws.

Incubation period

Undetermined and variable.

Period of communicability

As long as open lesions remain, as proved by the presence of the infectious agent on microscopic or cultural tests.

Susceptibility and immunity

Susceptibility in cattle and man is general. Acquired immunity does not follow occurrence of the disease in man, and artificial immunity is not practicable.

Prevalence

Infrequent among humans.

Methods of control

The Infected Individuals, Contacts, and Environment

Recognition of the disease: Clinical symptoms, confirmed by microscopic examination of discharges from the lesions.

Isolation: None, provided the patient is under adequate medical supervision.

Concurrent disinfection: Of discharges from lesions and articles soiled therewith.

Terminal disinfection: By thorough cleansing.

Quarantine: None.

Immunization: None.

Investigation of source of infection: In some cases exposure to infected cattle may be important.

General Measures

Observance of hygiene of oral cavity.

Inspection of meat, with condemnation of carcasses or infected parts of carcasses of infected animals.

Destruction of known animal sources of infection.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic and cultural examination of material from abscesses or other lesions and sputum for actinomycosis.

Collection of specimens

Collect pus from abscess in sterile bottle provided in standard tuberculosis mailing outfit supplied by the Division of Laboratories. If lesion is small, collect pus on sterile swab and insert in sterile tube; standard diphtheria mailing outfit may be used. Special containers will be supplied upon request to the Division of Laboratories. In all cases mark accompanying report slip plainly "For Actinomycosis."

Interpretation of results

Positive: Organism isolated giving typical cultural characteristics of *actinomyces.*

Negative: No organisms typical of the genus *actinomyces* isolated.

Presumptive evidence of infection may be made by microscopic examination, but this should be confirmed by culture whenever possible.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

ANTHRAX

Recognition of the disease

Two forms occur—external, due to direct inoculation through a cut or abrasion; and internal, caused by ingestion or inhalation of bacilli or their spores. Following the initial papule and vesicle at the external site of inoculation, an eschar develops and then hard edematous swelling of deeper and adjacent tissues. Freedom from pain is usual. Constitutional symptoms do not parallel the gravity of the lesions. Confirmation by microscopic examination of the lesions and discharges for *B. anthracis.* Internal anthrax resembles intestinal poisoning, toxic pneumonia, or meningitis; the recovery of the bacilli from the blood or spinal fluid confirms the diagnosis.

Etiologic agent

Anthrax bacillus, *Bacillus anthracis.*

Source of infection

Hair, hides, flesh and feces of infected animals.

Mode of transmission

Inoculation as by accidental wound or scratch, inhalation of spores, ingestion of insufficiently cooked meat, and mechanically by flies.

Incubation period

Within seven days, usually less than four; may be within 24 hours in pulmonary cases.

Period of communicability

During the febrile stage of the disease and until lesions have ceased discharging. Infected hair and hides of infected animals may communicate the disease many months after slaughter of the animal and after drying of hide, fur, or hair, unless disinfected.

Susceptibility and immunity

Man is not as susceptible as the domestic animals, especially the herbivora, but more so than the carnivora. Immunity may develop following an attack of the disease. Artifical active immunity, widely used for domestic animals, is not appropriate for humans.

Prevalence

Most common on the eastern seaboard, in humans and associated usually with the occurrence of the disease in cattle, or with handling of hide and wool products from infected animals. In epidemic form in cattle in various countries.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical and bacteriologic.

Treating with penicillin or sulphadiazine.

Concurrent disinfection: Of the discharges from lesions and articles soiled therewith. Spores can be killed only by special measures such as steam under pressure or burning.

Terminal disinfection: Thorough cleaning.

Immunization: None.

Investigation of source of infection: Search for the product of the infected animal, and trace to origin for discovery of disease in sporadic or epidemic form in domestic animals, where it will be found in all but rare instances.

General Measures

Animals ill with disease presumably anthrax should be isolated immediately in the care of a veterinarian. Animals

proved to have the disease should be treated with sulfonamides and penicillin or destroyed, preferably by incineration.

Immunization of exposed animals under direction of the State Department of Agriculture, Division of Animal Industry, or county livestock sanitary authority.

Post-mortem examination of animals should be made only by a veterinarian or in the presence of one.

Milk from an infected animal should not be used.

Control and disinfection of effluents and trade wastes and of areas of land polluted by such effluents and wastes from factories or premises, where spore-infected hides or other infected hide and hair products are known to have been worked up into manufactured articles are essential.

Every shipment of raw hides, wool, hair, or bristles from sources which are not known to be free from anthrax infection should be examined by an expert bacteriologist.

A physician should be constantly employed by every company handling raw hides, or such companies should operate under the direct supervision of a medical representative of the health department.

Every employee handling raw hides, hair, wool, or bristles who has an abrasion of the skin should immediately report to a physician.

Special instruction should be given to all employees handling raw hides in regard to the necessity of personal cleanliness.

Tanneries and woolen mills should be provided with proper ventilating apparatus so that dust is promptly removed before reaching the respiratory tract of human beings.

Disinfection of hair, wool, and bristles from sources known to be or suspected to be infected, before they are used or sorted should be obligatory.

The sale of a hide from an animal infected with anthrax should be prohibited. A violation of this regulation should be immediately reported to the appropriate state livestock sanitary authority by telegram, stating the time, place, and purchaser to whom the hide was sold. The report should also be sent to the person purchasing the hide. Carcasses should be disposed of under the supervision of the appropriate livestock sanitary authority. Imported hides are subject to regulations administered by the United States Bureau of Animal Industry. In the event that infection is introduced, the state livestock sanitary authorities have jurisdiction over infected animals and the local or state health authorities have jurisdiction over infected persons.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of pus or other body fluid for presence of *Bacillus anthracis.*

Examination of articles suspected of contamination with spores of *B. anthracis.*

Collection of specimens

Pus tissue or infected material should be collected aseptically and placed in a sterile bottle for mailing.

Articles such as brushes should be packed carefully in a double container and submitted to the laboratory, preferably by Railway Express.

No special containers are provided, but suitable mailing containers will be supplied upon request to the Division of Laboratories.

Interpretation of results

Positive report: Organism isolated and identified as *B. anthracis* by cultural examination and animal inoculation.

Negative report: *B. anthracis* not isolated.

Since anthrax bacilli are usually not present in the blood stream in large numbers until just before death, a blood specimen is of value only during the last stages of the disease.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2552. The patient shall be isolated until the lesions have healed. No control need be exercised over contacts when the case is properly isolated.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

That it is advisable to protect bed linen from contamination by using generous dressing. If linen becomes soiled with discharges, it must be sterilized under pressure in an autoclave before washing.

Teach procedures for: Disposal of nose and throat discharges, disposal of uneaten food, care of dishes, terminal disinfection.

ASCARIASIS

Recognition of the disease

Frequently, the first sign of infection is the spontaneous passage of an adult worm. The symptomatology is extremely vague except in heavy infection when individuals may exhibit respiratory signs because of migrating larvae, digestive disturbances, abdominal pain, protruding abdomen, exaggerated nervous reflexes, restlessness, and disturbed sleep. The diagnosis usually depends on finding the ova in the stools.

Etiologic agent

Ascaris lumbricoides, the large intestinal roundworm of man.

Source of infection

Excreta of infected persons, patricularly children, and articles soiled with such excreta in and about houses lacking facilities for sanitary disposal of human wastes.

Mode of transmission

By direct or indirect transmission of the embryonated eggs from soil or other polluted material to the mouth. The embryonated eggs hatch in the intestinal canal, larvae penetrate the wall, and reach the lungs by the circulatory system. Most of those which reach the lungs in the blood stream pass into the air passages, throat, and stomach, and thence to the small intestines where they mature. Polluted soil may be carried on the feet or footwear into houses and conveyances, and for some distances in dust.

Incubation period

The worms reach maturity in the body about two months after infection.

Period of communicability

As long as mature female worms live in the intestine. The production of about 200,000 eggs a day permits a high degree of fecal pollution even when the infection is light.

Susceptibility and immunity

Susceptibility is general and even relative resistance to repeated infection cannot be relied upon.

Prevalence

High incidence of infection is found where low standards of hygiene, lack of sanitary essentials, poverty, and ignorance create the conditions conducive to intensive pollution of soil in the immediate vicinity of houses. Children of the runabout and early school age are likely to be more frequently and more heavily infected than are older children and adults. Particularly prevalent in the United States among the people of the Appalachian Plateau.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: By examination of the stools for ova.

Treatment: Suitable treatment for the removal of adult worms from infected individuals with hexylresorcinol or oil of chenopodium.

Isolation: None.

Concurrent disinfection: Sanitary disposal of feces, and washing hands in soap and water after defecating and before eating.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Individual and environmental sources of infection should be sought for in the persons and premises of the patient's family particularly.

General Measures

Provision for adequate facilities for proper fecal disposal and elimination of soil pollution in areas immediately adjacent to the home, particularly in play areas of children.

In rural sections, privies should be so constructed as to obviate dissemination of ascarid ova through overflow, drainage, and other factors.

Education of all members of family, particularly children, to use toilet facilities.

Encouragement of satisfactory hygienic habits on the part of children in particular, especially the practice of washing the hands before handling food, and after defecating.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available Microscopic examination of feces for ova of *Ascaris lumbricoides* or identification of adult worm when passed.

Collection of specimens Take portions of feces from various parts of the stool and submit in standard container for Amoebic Dysentery provided by the Division of Laboratories. Mark accompanying slip plainly "For Ascariasis."

Interpretation of results Positive: Ova identified microscopically as those of *Ascaris lumbricoides* present.

Negative: No ova demonstrated.

A series of stool specimens should be submitted for examination for intestinal parasites before relying upon negative findings.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

BARTONELLOSIS

(Oroya Fever, Verruga Peruana)

Recognition of the disease

Oroya fever stage (acute). Gradual onset with malaise, irregular remittent fever usually between 37.8 degrees and 38.9 degrees C. (100 degrees and 102 degrees F.). Pains in joints, bones, and head. Rapidly developing severe anemia. The presence of the rod-shaped etiologic agent in the red blood cells is diagnostic. History of travel in special areas of Peru, Ecuador, and Colombia.

Verruga peruana stage (chronic). Frequently follows the acute stage. Severe joint pains, asthenia accompanied by fever. Numerous skin nodules of varying size which tend to bleed.

Etiologic agent

Bartonella bacilliformis.

Source of infection

The blood of an infected individual.

Mode of transmission

Anthropophilic sand flies of the genus *Phlebotomus.*

Incubation period

Oroya fever stage 16 to 22 days. Verruga peruana stage has an indefinate incubation period, possibly 30 to 60 days.

Period of communicability

Unknown. Probably as long as organisms are present in the red blood cells.

Susceptibility and immunity

Susceptibility general but the disease is milder in children than in adults; an attack gives permanent immunity.

Prevalence

This disease is limited largely to narrow mountain valleys of Peru, Colombia, and Ecuador, especially between latitude 2 degrees North and 13 degrees South.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: Clinical symptoms to be confirmed by microscopic examination of the blood and blood cultures.

Isolation: The infected individual should be protected from the bites of *Phlebotomus* by very fine-mesh screens, Aerosol DDT which contain pyrethrum, and insect-proof bed nets.

Concurrent disinfection: None. Destruction of sand flies in the dwelling.

Terminal disinfection: None. Destruction of sand flies in the dwelling.

Quarantine: None.

Immunization: None.

Investigation of source of infection: The finding of *Phlebotomus* breeding places, especially in masonry cracks, under stones and in rubble heaps.

General Measures

Screening sleeping and living quarters; use of insect nets with 25-30 meshes per inch which should be sprayed with an insect repellent and insecticide before entering. Window screens should be sprayed nightly.

Killing adult sand flies in living quarters.

Elimination of breeding places in proximity to dwellings.

Avoidance of known infected areas.

The use of an insect repellent carefully applied each evening to the exposed parts of the body.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available Examination of blood films for presence of organisms resembling *Bartonella bacilliformis.*

Collection of specimens Prepare thin blood film as for malaria.

Interpretation of results Positive: Organisms resembling *Bartonella bacilliformis* seen in the blood film. Since the report is based on microscopic examination it should be considered only as confirmation of clinical diagnosis.

Negative: No organisms resembling *Bartonella bacilliformis* found on microscopic examination of the blood film.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

CHANCROID

(Soft Chancre)

Recognition of the disease

Occurring as an acute, localized, auto-inoculable venereal disease of both sexes, chancroid is characterized clinically by necrotizing ulcerations at the site of inoculation. There is frequently an inflammatory swelling and suppuration of the adjacent lymph nodes. Laboratory identification of the *Hemophilus ducreyi* and immunologic reactions (skin tests) are of diagnostic value but the chief reliance must be placed upon the clinical signs and symptoms, history of exposure, and exclusion of primary syphilis and lymphogranuloma venereum.

Etiologic agent

Ducrey bacillus, *Hemophilus ducreyi.*

Source of infection

Discharges from lesions.

Mode of transmission

Chancroid is predominantly venereal in origin but has occurred rarely on the hands of doctors and nurses through professional contact. It may similarly occur in children through accidental inoculation. Acquisition through indirect contact with articles soiled with moist discharges from the lesions of infected persons is rare.

Incubation period

One to 10 days, usually three to five days.

Period of communicability

As long as the etiologic agent persists in the original lesion or regional adenitis. There is some evidence that carriers of the *Hemophilus ducreyi* may result from former but healed chancroidal infections.

Susceptibility and immunity

Susceptibility is general. There is no evidence of natural or acquired immunity. One attack does not confer protection against subsequent infection.

Prevalence

Widespread but particularly common in subtropical and tropical areas, among populations sexually promiscuous and living on a low economic and social level.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms confirmed if possible by bacteriologic examination or intradermal tests.

Isolation: Exclusion from intimate personal contact until lesions are healed.

Concurrent disinfection: Discharges from lesions and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of sources and contacts of infection: Search for and examination of persons who may have had sexual contact with the patient approximately two weeks prior to the appearance of the lesion and also of persons who may have had contact with the patient during the period since signs and symptoms have been present.

General Measures

Provision for adequate diagnostic and treatment facilities.

Public education concerning the nature of chancroid and its method of spread.

Adequate epidemiologic service associated with diagnostic and treatment facilities.

Repression of prostitution and improvement in sex behavior in cooperation with social and law enforcement agencies.

See Methods of Control and General Measures under "Syphilis."

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of smears of fluid or exudate from lesions, preferably before they ulcerate.

Examinations are usually made in laboratories connected with local clinics.

Collection of specimens

With sterile swab collect material from lesion and smear on clean microscopic slides. The standard gonococcus mailing outfit supplied by the Division of Laboratories may be used. Mark accompanying report slip plainly condition suspected "Chancroid—examine for Ducrey's bacillus."

Interpretation of results

Positive report: Organisms morphologically typical of *Hemophilus ducreyi* present on smears.

Negative report: No organisms resembling *H. ducreyi* seen on smears.

The presence of extremely small gram-negative bacilli with no capsules and no spores is usually sufficient for diagnosis and is considered confirmatory of clinical evidence of this infection.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

See section on venereal diseases.

Public Health Nursing Responsibility

Teach content included in above sections.

Assist in case finding by:

a. Encouraging medical examination of everyone presenting symptoms.
b. Careful interviewing of known cases for contact information when so ordered by physician and when nurse is assigned to clinic service.
c. Follow-up of sex contacts of known infectious cases when it is the agency's policy to have a public health nurse do this.

Assist in case holding by:

a. Individual patient education through interview.
b. Assisting the patient to establish a routine for medications as ordered.
c. Follow-up of cases until discharged as cured.

Teach patient importance of reporting treatment reactions if under sulfatherapy (headaches, dizziness, nausea, vomiting, cyanosis, hematuria, fever, acidosis).

Teach procedures for disposal of dressing and care of linen.

CHICKENPOX

(Varicella)

Recognition of the disease

An acute disease, primarily of children with a slight fever, mild constitutional symptoms, and an early eruption, maculopapular for a few hours, often not observed, vesicular lasting three to four days, leaving a granular scab. Vesicles tend to be more abundant on the covered than on the exposed parts of the body, and usually appear in different stages on the same region of the body. The vesicles may be so few as to escape observation. The lesions appear also on the mucous membranes of the upper respiratory tract and upon the scalp.

Etiologic agent

A specific filterable virus.

Source of infection

The infectious agent is presumably present in the lesions of the skin and of the respiratory tract; lesions of the latter, appearing early and sometimes inapparent, may render the disease communicable before the exanthem is in evidence.

Mode of transmission

Directly from person to person; indirectly through articles freshly soiled by discharges from nose, throat, and lesions of an infected person.

Incubation period

Two to three weeks.

Period of communicability

Probably not more than six days after the appearance of the first crop of vesicles. Especially communicable in the early stages of the eruption. One of the most readily communicable of diseases.

Susceptibility and immunity

Susceptibility is practically universal among those who have not previously had the disease. An attack confers permanent immunity with rare exceptions.

Prevalence

Universal. Probably 70 percent of persons have had the disease by the time they are 15 years of age. Not uncommon in early infancy. Winter and spring are seasons of greater prevalence in North America.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: The chief public health importance of this disease is that cases thought to be chickenpox in persons over 15 years of age, or at any age during an epidemic of smallpox, are to be investigated to eliminate the possibility of their being smallpox.

Concurrent disinfection: Articles soiled by discharges from the nose and throat and from lesions.

Terminal disinfection: Thorough cleaning.

Immunization: None advised. Gamma immune globulin may be of value in preventing the disease in exposed infants suffering from a debilitating illness.

Investigation of source of infection: Of no importance.

General Measures

None.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2554. The patient shall be isolated for at least seven days after the appearance of the first crop of vesicles. The health officer shall investigate all cases of chickenpox in persons over 15 years of age and in any person in whom he has reason to suspect smallpox. When a person affected with chickenpox is properly isolated, members of the family or household are not subject to restrictions.

Public Health Nursing Responsibility

Teach content included in above sections as well as: Control of scratching to prevent local infections and scars.

Teach procedures for: Disposal of nose and throat discharges; terminal disinfection.

CHOLERA

Recognition of the disease

In a few mild cases, diarrhea may be the chief or only symptom. In the typical case, rice-water stools, vomiting, and general symptoms of dehydration occur with thirst, abdominal pain, and coma. The cholera vibrios are found in the stools.

Etiologic agent

Cholera vibrio, *Vibrio comma.*

Source of infection

Bowel discharges and vomitus of infected persons, and feces of convalescent or healthy carriers. Contacts may become temporary carriers.

Mode of transmission

By water and raw foods; by contact with infected persons, including carriers, or articles freshly soiled by their discharges; by flies.

Incubation period

From a few hours to five days, usually three days.

Period of communicability

Until the cholera vibrio is absent from the bowel discharges, usually 7 to 14 days. A high degree of communicability is usual.

Susceptibility and immunity

Susceptibility is general, although natural immunity appears to exist to a limited degree. Acquired immunity is uncertain. Active artificial immunity for about 6 to 12 months may be obtained by vaccines.

Prevalence

Absent in the Western Hemisphere (except when introduced from abroad). Appears occasionally in epidemic form in the Philippines. Prevalent in India and the Orient.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms confirmed by bacteriologic examination of stools. Treatment with sulfadiazine is uncertain, but replacement therapy is most important.

Concurrent disinfection: Prompt and thorough disinfection of the stools and vomitus. Articles used by and in connection with the patient must be disinfected. Food left by the patient should be burned.

Terminal disinfection: The room in which a patient was isolated should be thoroughly cleaned.

Investigation of source of infection: Search for unreported cases and carriers. Investigate possibility of infection from polluted drinking water or from contaminated uncooked foods.

General Measures

Rigid personal protection of attendants by scrupulous cleanliness, disinfection of hands each time after handling the patient or touching articles contaminated by dejecta, the avoidance of eating or drinking anything in or from the room of the patient, and the prohibition of those attendant on the patient from entering the kitchen.

The bacteriologic examination of the stools of all contacts to determine carriers. Isolation of carriers and treat with sulfadiazine.

Boiling of all water, if used for drinking, toilet purposes, or washing dishes or food containers, unless the water supply is adequately protected against contamination or is so treated (as by chlorination) that the cholera vibrio cannot survive in it.

Careful supervision of food and drink: Where cholera is prevalent, only cooked foods should be used. Food and drink after cooking or boiling should be protected against contamination, as by flies and human handling.

Control of fly breeding and screening of kitchens and eating places.

Epidemic Measures

Inspection service for early detection and isolation of infected person; isolation or control of carriers; cleaning of rooms occupied by the sick, and the detention, in suitable camps, for five days of those desirous of leaving for another locality. Those so detained should be examined for detection of carriers before release. Widespread active immunization in the affected community should be undertaken.

Immunization

Who should be immunized

Immunization against cholera is not ordinarily of practical importance in California except for travelers into foreign areas. Consult the State Department of Public Health by telephone for special directions in the event of an outbreak.

Administration

Immunizing agent and dosage: A commercial cholera vaccine (India strain) containing 8,000 million vibrios per cc., is available. In adults, two injections of 0.5 cc., and 1.0 cc., are given subcutaneously, seven days apart. When it is desired to maintain immunity, a reinforcing injection of 1.0 cc., should be given every six months. Protection is said to be established by the tenth day after inoculation, reaching a peak from the tenth to the one hundred and twentieth day.

Reactions

Local and systemic reactions occur but are mild. For this reason injection should be given late in the afternoon. Avoid intramuscular or intravenous injection.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of feces for cholera vibrio *(Vibrio comma)*.

Collection of specimens

Collect 2 cc. of the feces, which are usually liquid, and submit in the standard container as described under typhoid fever. Mark the accompanying report slip plainly "For Cholera."

Interpretation of results

Positive report: *Vibrio comma* isolated and identified.

Negative report: No organisms isolated which resemble the *Vibrio comma.*

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

SECTION 2556. The local health authority shall communicate immediately with the Director, State Department of Public Health, by telephone or telegraph, regarding case or suspected case and special instructions will be issued.

Contacts

Special instructions will be issued by the Director, State Department of Public Health.

Public Health Nursing Responsibility

Teach content included in above sections.

Collect specimens as directed and teach procedure to attendant.

Teach procedures for: Disposal of uneaten food which must be burned, care of dishes, care of linen, disposal of excreta including vomitus (both must be treated before being disposed of in flush toilet as well as privy), terminal disinfection.

CHORIOMENINGITIS

Recognition of the disease

The disease may begin with an influenza-like attack capable of differential diagnosis by laboratory methods only. Recovery from these grippe-like symptoms may terminate the attack, or after a few days of more or less complete remission meningeal symptoms may suddenly appear, such as severe headache, stiff neck, vomiting, positive Kernig and Brudzinski signs. In some cases meningeal symptoms usher in the attack, there being no preceding illness. In severe cases meningo-encephalitic symptoms such as somnolence, disturbed deep reflexes, paralysis, and anaesthesias have been observed. Spinal fluid sterile to bacterial culture, cell counts may vary up to 3,500 cells, mainly lymphocytes, sugar and chlorides usually within normal limits. Isolation of virus from the blood or spinal fluid drawn early in attack and inoculated intraperitoneally into guinea pigs or intracerebrally into mice establishes diagnosis. Specific immunity demonstrable by serum-virus neutralization test apparent after six to eight weeks following onset and thereafter for years in most cases. Complement fixation with serum is positive for a short time following an acute attack.

Etiologic agent

A specific filterable virus.

Source of infection

No evidence of person-to-person transmission. Reservoir of virus found in house mice *(Mus musculus musculus)*.

Mode of transmission

The virus escapes from infected animals in mouth and nasal secretions, urine, and feces. Transmission to man is probably through infected food or dust, possibly occasionally by insects. Dogs, guinea pigs, white mice, and monkeys are susceptible to the virus.

Incubation periods

Probably 8 to 13 days from infection to systemic manifestations, 15 to 21 days to meningeal symptoms. Information is limited.

Period of communicability

There is no evidence of transmission through person-to-person contact. Naturally infected mice carry the virus throughout life and the female transmits the virus to her offspring.

Susceptibility and immunity

Unknown except that the blood serum in recovered cases, and that of many persons without a history of a recognized attack, neutralize the virus.

Prevalence

Rare but more common than the number of recognized cases indicates.

Methods of control

Information is lacking, but prevention is probably furthered by reducing or eliminating mouse infestation from quarters frequented by man, especially those wherein cases have originated.

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical symptoms, assisted by isolation of the virus from the blood or spinal fluid drawn early in the attack, or by a negative serum-virus neutralization test early in the attack followed by a positive test about two months

after onset. Complement fixation test five days after onset and again 16 days after onset with rise in titer.

Isolation: None.

Concurrent disinfection: Discharges from the nose and throat, urine and feces, and articles soiled therewith.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Home and place of employment should be investigated especially for the presence of house mice with attention also to presence of bedbugs and mosquitoes, and pets such as dogs.

General Measures

General cleanliness of home and place of work, with elimination of mice therefrom.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Complement fixation tests on blood specimens.

Isolation of the virus in animals; neutralization tests.

Collection of specimens

Collect approximately 10 cc. venous blood aseptically as soon after onset as possible and again 12-14 days after onset. Place blood in sterile rubber stoppered vials and send in mailing containers. These may be obtained upon request from the Division of Laboratories.

Complete accompanying report slip, being sure to give *date of onset, disease suspected, date of specimen,* and, for blood, whether first or second specimen. These data are essential to performance and interpretation of the tests.

Interpretation of results

Positive report: Complement fixation three plus or four plus at a dilution of 1-6 or higher. The result is confirmed by demonstration of a rising titer.

Negative report: No reaction or fixation at two plus or less at a dilution of 1-6.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

COCCIDIOIDOMYCOSIS *

(Coccidioidal Granuloma, "Valley Fever")

Recognition of the disease

Initial or primary infection. Nearly always a pulmonary infection focalizing as does primary tuberculosis. It occurs as:

1. Inapparent, asymptomatic infection involving most inhabitants of endemic areas and exposed laboratory workers, usually recognizable only by development of sensitivity to coccidioidin, and accounts for one-half to two-thirds of the infections.

2. Acute respiratory or influenza-like illness suspected on basis of any of the following symptoms: malaise, chest pain, cough, fever, chills, anorexia, nightsweats, headache or backache but diagnosable only by demonstration of change from negative to positive coccidioidin reaction, demonstration of the fungus in sputum or gastric contents by culture and animal inoculation or positive serological findings. X-ray often shows pulmonary lesions, enlarged hilar nodes, and occasionally pleural effusion. Rarely, a cavity develops in one of these lesions and may persist, thin walled, well focalized and causing few symptoms other than occasional hemoptysis.

3. An attack of erythema nodosum or erythema multiforme in from 2 to 5 percent of either of the above two types when sensitivity to coccidioidin is established. This is true "San Joaquin Fever," "Valley Fever," or "Desert Rheumatism." Latter name is due to frequently associated joint pain rarely accompanied by redness or swelling. Phlyctenular conjunctivitis often accompanies.

Progressive, "secondary," disseminated infection, long known as coccidioidal granuloma and sometimes as chronic granulomatous coccidioidomycosis or "San Joaquin Valley Disease." This disease, a rare complication of the initial infection, is nearly always manifest within a few months thereof and often without any interlude. Usually fatal, the disease may be miliary or mimic extra-pulmonary tuberculosis such as meningitis, skin, lymph node, bone or joint lesions or peritonitis. Multiple subcutaneous abscesses are frequent. Diagnosis is established by biopsy plus the other procedures mentioned above. Coccidioidin reaction may be much less active than in primary infection and may be lost progessively until patient is anergic terminally.

Etiologic agent

Coccidioides immitis.

Source of infection

Chlamydospores of "vegetative phase" of the fungus carried in dust mainly blown through the air but occasionally on clothing and dusty contaminated products. Where fungus reproduces in nature is unknown.

Mode of transmission

Inhalation of the spores, rarely through abrasions, never by ingestion.

Incubation period

One to three weeks, generally 10 to 16 days for initial type infection. Interval for dissemination variable. Rare after six months and very rare after a year.

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* Contributed by Dr. C. E. Smith, Professor of Preventive Medicine, Stanford Medical School, San Francisco, California.

Patient not infectious. Endosporulating spherules of "parasitic phase" not adapted to exogenous dissemination. **Period of communicability**

All ages susceptible to infection. One infection confers immunity to exogenous and endogenous reinfection. Erythema nodosum occurs in 4 percent white males and 10 to 25 percent white females. The dark-skinned males are most apt to have progressive form (Coccidioidal granuloma). Dissemination occurs only once in 400 primary infections in white males. Females disseminate one-half to one-quarter as often as males. Dissemination is very rare after the infection is well focalized. Progressive disease is apparently comparable to tuberculosis in very young. **Susceptibility and immunity**

Endemic areas are semi-arid; U. S. A. notably in California (especially San Joaquin Valley), Southern Arizona, West Texas; also known to include northern Mexico, northern Argentina and adjoining regions. Seasonal peak is in dusty summer and fall, with ebb in rainy period. Nearly all residents and probably most other mammals of important endemic regions become infected. **Prevalence**

The Infected Individual, Contacts, and Environment **Methods of control**

Recognition of the disease: (See above for symptoms.) Laboratory findings (necessary for confirmation).

(1) Biopsy of disseminated lesion demonstrating double contoured spherules with endospores and without budding. (Absolute proof.)

(2) Growth of the living fungus, identity being established by demonstration of diphasic character (mycelium on culture, spherules on animal inoculation). (Absolute proof.)

NOTE: Coverslip identification of spherules in sputum is insufficient.

Culturing of fungus apt to result in laboratory infections.

(3) Coccidioidin reaction. Coccidioidin prepared much as is tuberculin, using similar synthetic medium. Not concentrated. Administer as 0.1 cc. of proper saline dilution (usually 1:100) intracutaneously. Convenient to add 0.1 cc. of undiluted coccidioidin to 9.9 cc. sterile saline. Read at 24 and 48 hours with same criteria as tuberculin (over 5 mm. induration being positive). Significance is same as tuberculin, reaction denoting previous infection but giving no indication of when infection acquired. No reaction indicates no previous infection (or immunity), with exception of disseminated infection with which coccidioidin reaction is frequently weak or absent. Erythema nodosum patients exceedingly sensitive. Strong reactions do not flare up infections. Some equivocal reactions in persons from Mississippi River basin. Care exercised so that diluting equipment and luers are used for no other biologics. If kept sterile and refrigerated, 1:100 coccidioidin retains potency over six months. Change from no reaction to positive is conclusive proof of infection (recalling that it takes one or two days to 10 to 14 days for allergy to be established). Otherwise, coccidioidin is simply a useful screen.

(4) Serologic tests. Precipitin and complement fixation tests used together. Of both diagnostic and prognostic value. Serological tests become positive *after* allergy established.

Except in disseminated infections with allergy, serology performed only if coccidioidin reacts. Failure to demonstrate humoral antibodies does not eliminate diagnosis; demonstration of them is conclusive proof of infection (more severe the infection greater the certainty of tests). Specimen should be 10 cc. sterile whole blood (no preservative) or 5 cc. sterile serum with preservative of 5 mg. percent sulfanilamide or 0.5 cc. *aqueous* 1:1000 merthiolate. Container should be sterile with stopper of composition or rubber, *NOT cork*. Specimen should be accompanied by information as to: Name, Physician, Date of arrival in endemic area, Date of onset of symptoms (including cardinal findings), Date and result of coccidioidin tests, Date specimen obtained. These data needed for interpretation of findings.

(5) X-ray. Findings vary. May be no lesion demonstrable. Frequent fan shaped lesion of lung parenchyma. Single or multiple discrete densities. May be extensive consolidation of entire lobe or even a lung. Frequently merely increased bronchial markings or hilar shadow. Frequently fluid. Occasional rarefaction in site of previous density, cavity ultimately becoming thin walled. No *diagnostic* appearance.

(6) Hematologic changes. Sedimentation rate rapid during active infection. Useful means of evaluating significance of coccidioidin reaction and also of following the clinical course. Sometimes eosinophilia demonstrable.

Isolation: None.

Concurrent disinfection: Disposal of contaminated dressings and of sputum.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

General Measures

Local dust control measures advisable but of limited value. Without adequate method of preventing infections, minimize possibility of dissemination by keeping patient with initial infection at rest until clinical recovery, normal sedimentation rate, regression of X-ray findings and complement fixation titer (if performed) indicate infection is being well focalized. If X-ray lesion persists, should recheck at monthly intervals to be sure no cavity develops. Not feasible to hospitalize till lesion completely disappears, as it can continue for years. Does not indicate danger of dissemination.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available Examination of pus, sputum, gastric lavage or pleural fluid for presence of *Coccidioides immitis*.

Collection of specimens Collect suspected material in standard tuberculosis container provided by the Division of Laboratories. Mark accompanying report slip plainly "For Coccidioidomycosis."

In the pulmonary type of infection, sputum which has been coughed up from the lungs should be submitted. A specimen containing portions of sputum collected on two or three successive days may be advisable.

No preservative should be added to the specimen as this will render the material unsatisfactory for culture.

Interpretation of results

Positive report: *Coccidioides immitis* has been demonstrated microscopically and proved by culture and animal inoculation to be present in the material submitted.

Negative report: The presence of *Coccidioides immitis* was not demonstrated.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2558. Reportable only. Under ordinary circumstances no control need be exercised over case or contacts.

Public Health Nursing Responsibility

Teach content included in above sections.

Participate in case finding by referral of suspects to physician or local chest clinic.

Teach procedures for: Disposal of dressings, disposal of nose and throat discharges, care of linen, care of dishes.

COMMON COLD

Recognition of the disease

An acute catarrhal affection of the upper respiratory tract, usually accompanied by a slight rise in temperature on the first day and chilly sensations with coryza, and general indisposition or lassitude lasting two to seven days.

Etiologic agent

One or more filterable viruses; several strains have been isolated.

Source of infection

Discharges from nose and mouth of infected persons.

Mode of transmission

Usually directly by coughing, sneezing, and explosive manner of speech by which droplets are cast out into the air from the infected person to susceptible persons especially within short range; and indirectly by handkerchiefs, eating utensils, or other articles freshly soiled by discharges of the infected person.

Incubation period

Probably between 24 and 48 hours; possibly as long as 72 hours.

Period of communicability

While the virus remains in the discharges, an undetermined period, it is believed to be limited to the early stages of the disease and probably no longer than a week from the onset.

Susceptibility and immunity

Susceptibility universal. A period of at least relative immunity follows an attack of the disease and appears to be effective for a month or so.

Prevalence

Most persons, except those living in small isolated communities, have one or more colds each year. The incidence does not vary materially according to age, sex, race, or occupation, but incidence appears to be highest in children under five years of age.

Methods of control

The Infected Individual, Contacts, and Environment

On recognition of the premonitory or early stage of a "cold," the infected person should avoid direct and indirect exposure of others, particularly little children, feeble or aged persons, or persons suffering from any other illness.

Isolation: Such modified isolation as can be accomplished by rest in bed during the acute stage of the disease is to be advised.

Concurrent disinfection: The disposal of nasal and mouth discharges by use of soft paper, to be burned or put in the toilet, or otherwise disposed of, to avoid contamination of hands and articles of common use, is to be urged.

Terminal disinfection: None, except airing and sunning room and bedding.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Unprofitable except as a research project.

General Measures

Education in the niceties of personal hygiene and disposal of nose and mouth secretions.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over cases or contacts.

CONJUNCTIVITIS

Acute Infectious (of the Newborn, not including Trachoma)

(This title includes gonorrheal ophthalmia, opthalmia neonatorum, and babies' sore eyes in the first 21 days of life.)

Recognition of the disease Acute redness and swelling of the conjunctiva of one eye or of both eyes, with mucopurulent and purulent discharge in which the infecting micro-organism is identifiable by microscopic and cultural methods.

Etiologic agents The gonococcus or some member of a group of pathogenic organisms, including the hemophilic bacilli and a filterable virus (inclusion blenorrhea).

Source of infection Discharges from conjunctivas, or adnexa, or genital mucous membranes of infected persons.

Mode of transmission Contact with an infected person or with articles freshly soiled with discharges of such person.

Incubation period Irregular, but usually 36 to 48 hours.

Period of communicability During the course of the disease and until the discharges from the infected mucous membranes have ceased. Readily communicable.

Susceptibility and immunity Susceptibility is general. Acquired immunity does not follow an attack of the disease.

Prevalence Occurrence varies widely according to the observance or neglect of prophylactic use of a solution of silver nitrate or equivalent preparation in the eyes of the newborn by the attendant at the delivery. An infrequent complication in the present-day care of the newborn.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms, confirmed where possible by bacteriologic examination.

Isolation: None, provided the patient is under adequate medical supervision.

Concurrent disinfection: Disinfection of conjunctival discharges and articles soiled therewith.

Terminal disinfection: Thorough cleaning.

Quarantine: None.

Immunization: None.

Investigation of source of infection — among persons recently in contact with the patient: The disease in the newborn is almost always due to infection from the genital tract of the mother.

Treatment: Systemic treatment of the patient with an appropriate chemotherapeutic agent.

General Measures

Use of 1 percent silver nitrate solution in the eyes of the newborn is the official prophylactic. Antepartum treatment of mother if gonorrhea is suspected.

Education as to personal cleanliness and as to the danger of the use of common towels and toilet articles.

Carrying out of the measures indicated in methods for control of gonorrhea.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

See section on gonorrhea.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2560. Prophylactic for conjunctivitis, acute infectious of the newborn, (ophthalmia neonatorum) shall be administered immediately after birth in accordance with Sections 551-556, Business and Professions Code. All physicians, midwives, and other persons lawfully engaged in the practice of obstetrics, may obtain, without cost, the prophylactic for ophthalmia neonatorum (silver nitrate solution in wax ampules), together with directions for its use, by applying to the State Department of Public Health, Division of Laboratories, 3093 Life Sciences Building, Berkeley 4, California.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach that any discharge of the eyes should be reported immediately to the physician.

Teach importance of disinfection and segregation of the patient's personal articles.

Teach procedures for: Disposal of dressings, care of linen, terminal disinfection.

Observe "Technique for Taking Eye Smear" if ordered to take smear by physician.

DENGUE

Recognition of the disease An acute febrile infection of sharp onset, usually with two paroxysms of short duration. Intense headache, joint and muscle pains, and irregular eruption are usual.

Etiologic agent A filterable virus.

Source of infection The blood of infected persons during first five, usually during first three, days of disease.

Mode of transmission By the bite of infected mosquitoes, *Aedes aegypti* (or *Aedes albopictus* in the oriental tropics), from 11 days after biting a patient until the death of the mosquito.

Incubation period Three to fifteen days, most often five to six days.

Period of communicability From the day before onset to the fifth day of the disease. Degree of communicability depends on the prevalence of infected humans and abundance of the vector *Aedes* mosquitoes.

Susceptibility and immunity Susceptibility apparently universal. Acquired immunity is temporary, and usually lasts six to nine months.

Prevalence May occur wherever the vector *Aedes aegypti* mosquito exists, but mainly in tropics and subtropics. *Aedes aegypti* is not known in California.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease, and reporting.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Search for unreported or undiagnosed cases and for the *Aedes aegypti* mosquito and its breeding places.

General Measures

Measures directed toward elimination of the vector mosquitoes and their breeding places. Screening of rooms. Use of repellents.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case SECTION 2562. The case shall be confined during the first five days of the disease in a room or dwelling satisfactorily screened and kept free of mosquitoes.

Contacts No control need be exercised over contacts.

Public Health Nursing Responsibility

Teach content included in above sections and in addition:

a. Assist family to accomplish isolation by screening.

b. Teach value of mosquito control in the rest of the home where patient is confined.

EPIDEMIC DIARRHEA OF THE NEWBORN

Recognition of the disease

An acute communicable disease of high infectivity affecting newborn infants chiefly in the nurseries of lying-in institutions. It is recognized by the characteristic clinical picture of severe diarrhea with watery stools containing little or no mucus and no blood, dehydration, and acidosis. Signs of other than enteric infection are lacking in uncomplicated cases; there is no fever except when severe dehydration is present and when pneumonia, otitis media, or other complications occur terminally. The disorder spreads rapidly from baby to baby in a nursery for newborn infants and is marked by a high case fatality rate. Bacteriological findings are usually negative; post-mortem examinations show remarkably few tissue changes and none pathognomic of the disorder. Epidemic diarrhea of the newborn may be confused with *Salmonella* infection, bacillary dysentery, and with diarrhea incidental to other disease.

Etiologic agent

Unknown. Probably a filterable virus.

Source of infection

Unknown.

Mode of transmission

Unknown, presumably direct or indirect person-to-person infection.

Incubation period

From two to twenty-one days, most frequently six to seven days.

Period of communicability

Readily communicable among newborn infants as long as symptoms are present.

Susceptibility and immunity

Babies are attacked from birth to over a year of age, most often eight to nine days of age. Whether an acquired immunity results is unknown. There are no known means of inducing artificial immunity. Older infants and adults seem to be immune. Premature infants are particularly susceptible.

Prevalence

The disease is met with frequently in the temperate part of United States and Great Britain, and is probably more widely spread. Epidemics occur slightly more frequently in the spring and winter months and usually in nurseries for the newborn.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical signs and symptoms in groups of cases in nurseries for the newborn, with negative bacteriological and post-mortem findings.

Concurrent disinfection: Disinfection of all discharges and articles soiled therewith.

Terminal disinfection: Thorough cleansing of nursery and equipment.

Isolation and reporting: The infant suspected of diarrhea shall be placed in strict isolation until discharged from the hospital and the case shall be reported immediately by telephone to the local health officer. Procedure to be followed:

(1) Isolate immediately all cases of diarrhea as defined above from exposed cases and *notify local health officer by telephone.* The disease strikes with minimal warning and prompt action in this regard is essential to prevent spread of the disease.

(2) If two or more cases occur, the nursery shall be quarantined and no newborn infants shall be admitted until all exposed infants have been discharged and the nursery thoroughly cleaned. All contacts should be observed carefully and immediately moved to isolation nursery if symptoms develop.

(3) An auxiliary clean newborn nursery should be established for new admissions separate and apart from the regular nursery.

(4) Separate nursery equipment as well as nursing service must be provided in:

(a) Isolation nursery with infected infants.

(b) Suspect nursery where infants have been exposed.

(c) Clean nursery.

(5) Careful check should be made of all techniques including nursing, formula preparation and refrigeration, feeding and hand washing to determine if a break in technique has occurred which might be responsible for the outbreak.

(6) Check all attendants entering delivery room, formula room and nursery for presence of any type of infection.

(7) All equipment of maternity service should be inspected for possible defects.

(8) No newborn infants should be admitted to the regular nursery until all exposed and isolated cases have been dismissed and the nursery thoroughly cleaned. At least 24 hours should elapse between the dismissal of the last baby and any new admission during which time the walls and floors of the nursery must be thoroughly scrubbed with soap and water, a maximum of air and sunlight admitted and all equipment coming in contact with infants thoroughly cleansed and exposed to direct sunlight or ultraviolet light for a period of at least six hours.

(9) In the event new cases of diarrhea appear in the clean nursery the entire maternity division should be closed until all patients and contacts are dismissed and all rooms and equipment thoroughly cleaned.

Immunization: None.

Investigation of source of infection:

(a) Follow-up examination of all infants discharged from the hospital in the period one month before the onset of the initially reported case. This is to recognize any earlier cases. When such are found, the babies should be immediately readmitted to an isolation nursery for proper treatment.

General Measures

The complete physical separation of the maternity service from all medical and surgical services in the hospital.

The establishment of completely equipped physical facilities in small units for the labor, delivery, and aftercare of uninfected maternity patients, each such unit to be served by a nursery for the care of uninfected newborn infants.

The establishment of completely equipped physical facilities in a unit for the labor, delivery, and aftercare of maternity patients with any form of infection, such unit to be served by

a cubicled nursery for the care of babies infected with diarrhea of the newborn or other communicable infections.

The organization of a maternity service nursing staff with duties limited to the care of maternity patients and their babies. Part of this staff should be assigned to the care of uninfected mothers and babies only, and another part to the care of maternity patients and their babies with any form of infection.

The establishment of a formula room specifically reserved for the preparation of formulas for newborn infants, apart from any diet kitchen, scullery, pantry, or place of food storage in the hospital.

The adoption of the principles of aseptic nursing care in the handling of all maternity patients and their babies in all phases of obstetrical and pediatric care.

The collection, storage, and laundering separately of all linens, diapers, and articles of clothing which may come in contact with the newborn.

Limitation of visiting hours. These are not to be permitted when newborn infants are being fed or nursed by the mothers. Visitors should be kept to a minimum, and children under 14 should be excluded. Special facilities should be provided to protect the newborn against possible introduction of infection into the nursery during religious rituals.

Proper treatment usually requires a starvation period, use of Ringers' and sodium lactate solution subcutaneously or intravenously, and ample amounts of human plasma by vein.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Consult the laboratory for services.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

(Diarrhea of the Newborn *)

Definition

SECTION 2564. The definition of a reportable case of diarrhea of the newborn shall be as follows:

Diarrhea of the newborn up to three weeks of age occurring in a hospital giving maternity service. Diarrhea of the newborn, regardless of etiology, shall be suspected to exist when an infant has more than one liquid stool in 24 hours and shall be considered definitely present if this persists for more than two days. An exception may be made in the case of entirely breast-fed infants who show no sign of illness and are gaining weight.

Isolation of case

SECTION 2564.1. The infant suspected of diarrhea shall be placed in strict isolation until discharged from the hospital, and the case shall be reported immediately by telephone to the local health officer.

Quarantine of nursery

SECTION 2564.2. If two or more cases occur, the nursery shall be quarantined and no newborn infants shall be admitted

* Official designation in California.

until all exposed infants have been discharged and the nursery thoroughly cleaned.

Section X, Part IV, of the Hospital Regulations:

Any occurrence, such as epidemic outbreaks, poisonings or other unusual occurrences, which threatens the welfare, safety or health of any patient admitted to any of the institutions covered by the Hospital Licensing Law, or the rules and regulations pertaining thereto, shall be immediately reported, either by telephone or telegram to the local health officer. The institution shall furnish such other pertinent information related to such occurrences as the local or State Department of Public Health may require.

All cases of diarrheal disorders, regardless of etiology, with symptoms described under definitions, shall be reported immediately by telephone to the local health officer so that steps can be taken to set up control measures before a potentially serious infection has spread through the nursery.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

Immediate reporting to attending physician of watery, odorous or frequent stools of newborn.

Follow-up newborn infants discharged from hospitals in which the disease is known to exist.

Teach by demonstration:

a. Isolation and general care of the patient.

b. Formula preparation and feeding routine as ordered.

c. Administration of medications ordered.

Teach procedures for: Disposal of dressings, care of linen, terminal disinfection.

DIPHTHERIA

Recognition of the disease

An acute febrile infection, generally of the air passages, especially of tonsils, throat, and nose, marked by a patch or patches of dirty white and grayish membrane, from which cultures of the diphtheria bacillus may be obtained. Cases of diphtheritic infection in infants and cases of nasal diphtheria at any age are frequently not recognized because of the absence or difficulty of detection of local signs or symptoms, particularly in children who have received prophylactic injections of antitoxin.

Etiologic agent

Diphtheria bacillus, *Corynebacterium diphtheriae* (the Klebs-Loeffler bacillus).

Source of infection

Discharges from diphtheritic lesions of nose, throat, conjunctiva, vagina, and wound surfaces. Secretions from the nose and throat of carriers of the bacillus.

Mode of transmission

Directly by personal contact, indirectly by articles freshly soiled with discharges, or through contaminated milk or milk products.

Incubation period

Usually two to five days, occasionally longer if the carrier state precedes the development of clinical symptoms.

Period of communicability

Variable, until virulent bacilli have disappeared from the secretions and the lesions. Usually two weeks or less, seldom over four weeks.

Susceptibility and immunity

Infants born of mothers with an established immunity are relatively immune for the early months of life. This passive congenital immunity has been lost in a high percentage of infants by the sixth month. Subsequently children and adults develop immunity apparently in approximate proportion to their contact with associates who carry the diphtheria bacillus with or without exposure to persons with recognized attacks of the disease. Such accidental immunity is less frequent among rural and small-town populations. Passive temporary immunity (10 days to three weeks) and active immunity of relatively permanent duration can be developed artificially. Recovery from an attack of the disease, especially if with the aid of therapeutic diphtheria antitoxin, is not necessarily followed by active immunity.

Prevalence

Endemic and epidemic. Two-thirds or more of the urban cases are in children under 10 years of age and two-thirds or more of the urban deaths occur in children under five years of age. More common in temperate zones than elsewhere, and in fall and winter months.

Methods of control

The Infected Individuals, Contacts, and Environment

Recognition of the disease and reporting: By clinical symptoms with confirmation by bacteriologic examination of discharges.

Concurrent disinfection: Of all articles which have been in contact with the patient, and all articles soiled by discharges of the patient.

Terminal disinfection: At the end of the illness, thorough airing and sunning of the sick room, with cleaning.

Investigation of source of infection: Unreported cases, carriers, and possibly milk.

General Measures

Pasteurization of milk supply.

Educational measures to inform the public, and particularly the parents of little children, of the advantages of toxoid immunization in infancy and continued "booster" does up to at least 12 years of age.

Immunization

Who should be immunized

Routinely: All children between the ages of six months and 12 years. Immunization of adults is recommended in such exposed groups as physicians, nurses, and others whose occupations bring them into frequent contact with the disease and who are Kellogg or Schick positive. Routine immunization of children over 12 years of age is not recommended without preliminary Kellogg or Schick testing because of frequency of severe reactions in this age group, but should be done if tests are positive.

Administration, age 6 months to 12 years

Initial Series: Begin at six months of age, or as soon as possible after that age. Where immunization against pertussis and/or tetanus is also planned, the combined products (D. P. or D.P.T.) are recommended. The use of combined alum precipitated products is preferred because more immunizations with fewer injections can be accomplished and also more children can be immunized with the same personnel. Two doses of alum precipitated toxoid give a higher immunity than three doses of fluid toxoid.

Dosage and Interval: (For combined immunizations, diphtheria-pertussis-tetanus and also diphtheria alone.)

For Alum Precipitated Products: Use two injections (1 cc. and 1 cc.), deep subcutaneously or intramuscularly at monthly intervals. When using alum precipitated products, sterile abscesses will be minimized by exercising care not to have any material on the exterior of the needle. (Use a separate needle for withdrawing toxoid from the bottle, and a fresh needle if the toxoid is ejected while expelling air bubbles.)

For Plain Products: Use three injections (0.5 cc., 1.0 cc., and 1.0 cc.) at monthly intervals.

Reinforcing Injections: Routinely a diphtheria "booster" injection (0.5 cc. alum precipitated) is recommended one year following completion of the initial series or about two years of age and again at the time of entrance to school. This should be combined with a "booster" for pertussis and/or tetanus, if previous immunization has been carried out for these infections also. The dosage with alum precipitated products of the "booster" injections is one-half of the regular dose. "Booster" injections of *plain* diphtheria toxoid alone should be given to

previously immunized children after a known exposure or in the presence of an epidemic to effect a rapid rise in antibody titer.

Reactions: Severe reactions to diphtheria toxoid or to combined diphtheria-pertussis-tetanus products are rare in this age group. Nodules can be expected with alum precipitated products, local reactions are more frequent, and sterile abscesses may occur, particularly, if the material is on the exterior of the needle or is injected too superficially.

Administration, children over 12 years of age and adults who are Schick positive

Dosage and Interval: Small doses of *plain diphtheria* toxoid should be used until sensitivity is determined. It is advisable to start with 0.1 cc. and to double each succeeding dose weekly until a total of 1.0 cc. has been given unless severe local or systemic reactions occur, in which case a smaller dose may be continued for three or four injections.

Tests for immunity (Schick and Kellogg)

Not recommended as a routine public health procedure in those under 12 years of age. The same time and effort can be better spent in giving "booster" or stimulating doses of toxoid. These tests are of value to determine the immune status of older children in areas of high incidence, in rural areas, in groups of children in institutions, and in adults who are occupational risk, and are a recommended procedure in private practices. Recovery from clinical diphtheria does not guarantee immunity, particularly, if the case is treated early. These cases should be Schick tested after recovery to determine their immune status.

Treatment

Patients clinically diagnosed as having diphtheria should receive antitoxin, *promptly, without waiting for verification of diagnosis by nose and throat cultures.* A delay of 24 to 48 hours may mean the loss of life.

The amount of antitoxin administered varies according to the severity of the infection and the number of days elapsed since the onset. The dosage varies between 20,000 and 100,000 units. The entire amount of antitoxin should be given within a few hours, *not* in divided amounts over a period of several days.

For the mild type of infection, a minimum amount of 20,000 units of antitoxin is given intramuscularly; for the moderate type, the minimum amount should be 40,000 units intramuscularly; for *severe forms* which require 60,000 to 100,000 units or more, 40,000 units may be given intramuscularly and the remainder administered intravenously, diluted with glucose or saline solution. In general, the intravenous route is favored only for severe infection in children and the intramuscular route for adults. For the nasopharyngeal including "bull neck" cases in which there is higher toxin absorption, the dosage for the early case is a minimum of 60,000 units with an additional 20,000 units added for each day above four days from the onset through the seventh day.

CAUTION: Test for sensitivity to horse serum before administration of antitoxin. Special precautions should be observed when intravenous injection is planned and I. V. should be avoided if patient is very sensitive.

Passive immunization

Passive immunization with antitoxin is not recommended for exposed persons, who preferably should be examined daily by a physician or nurse to determine the presence of the disease. Where this is impossible, at least 10,000 units of antitoxin should be administered intramuscularly.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of nose and throat cultures for *Corynebacterium diphtheriae.*

Virulence tests by animal inoculation.

Kellogg tests on sera to determine immunity by means of skin tests on animals.

Collection of specimens

Nose and Throat Cultures: Collect specimens from nose and throat on swabs as directed on the reverse side of the report slip accompanying the special mailing containers provided by the Division of Laboratories. Mail immediately to the laboratory.

Virulence tests: Upon request of the health officer virulence tests will be performed on organisms isolated from specimens submitted. (See regulations regarding virulence tests on contacts, cases, and carriers Sections 2566.3, 2566.4, and 2566.5.)

Kellogg Tests: 2 to 5 cc. of blood collected aseptically in a sterile container and mailed by regular mail. Special containers are provided by the Division of Laboratories.

Interpretation of results

Nose and throat cultures: Positive report: Organisms seen which morphologically resemble *C. diphtheriae.*

Negative report: No organisms seen which resemble *C. diphtheriae.*

A positive report is considered confirmatory of the clinical evidence of the disease. A negative report should not be considered conclusive if there are clinical symptoms. In all such cases repeated specimens should be obtained. See the regulations for the release of cases, carriers, and contacts.

Virulence tests: Positive report: The culture tested produced a reaction on the test guinea pig resembling that produced by diphtheria toxin.

Negative report: The culture tested failed to show evidence of the presence of toxin.

Kellogg test: Immune—If test indicates $\frac{1}{30}$ unit or more of antitoxin per cc. of serum.

Not immune—If test indicates less than $\frac{1}{30}$ unit of antitoxin per cc. of serum.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

SECTION 2566. The patient shall be isolated during the acute stage of the disease; and until two successive nose and throat cultures taken not less than 48 hours apart fail to show the presence of diphtheria bacilli; and until all persons within the quarantined area are eligible for release.

Household contacts

SECTION 2566.1. Household contacts shall be quarantined until the case is eligible for release and until negative release cultures have been obtained from each person in the quarantined area; except that the health officer may, at his discretion, release household contacts to live elsewhere, or terminate the quarantine of the household when the case is removed from the quarantined area because of hospitalization or death, provided that, in either instance, the following conditions are met:

(a) If their nose and throat cultures are negative.

(b) If any member of the household is a school child; or is engaged in an occupation bringing him in close association with children; or if his occupation involves the handling of milk or other foods, a second negative nose and throat culture shall be required after he leaves the quarantined area but before he shall be permitted to return or engage in any of these occupations. At least 48 hours interval shall occur between the taking of these specimens.

(c) Provided they are kept under clinical observation for a period of five days after the last exposure.

Other contacts

SECTION 2566.2. Any one not a member of the household who has been in close association with a case of diphtheria shall be placed in isolation until a nose and throat culture has been obtained. If the culture is negative, the contact may be released from isolation but shall be kept under observation for a period of at least five days after the last exposure.

SECTION 2566.3. Any contacts not residing within the quarantined premises, whose nose and throat cultures are found to be positive for diphtheria, shall be kept in strict isolation until two successive negative nose and throat cultures have been obtained as in the release of a case of clinical diphtheria, except that a virulence test may be requested for all casual contacts having a positive culture and, if the virulence test is negative, such findings shall be accepted as a negative culture and the casual contact released.

Virulence tests

SECTION 2566.4. Whenever a case has been in isolation for a period longer than four weeks, virulence tests should be made on the positive cultures from the case and the contacts in the quarantined area and those cultures found to be avirulent may be considered as negative cultures. Those found to have virulent cultures may then be placed in a modified quarantine as provided in Section 2566.5, if the health officer feels that such can be done without jeopardizing the public health.

Carriers

SECTION 2566.5. Any person who has been free from the symptoms of diphtheria for four weeks or longer and who harbors virulent diphtheria bacilli is a carrier. A modified quarantine may be established, if, in the judgment of the health officer, such procedure is not detrimental to the public health, except that no member of the household shall be permitted to have any part in the preparation or serving of food to persons other than members of his immediate family; nor shall he be

engaged in any occupation or activity which brings him in contact with milk, milk products, milk bottles, or milk utensils; nor shall he in any way be in contact with children or large groups of people.

Laboratory tests for the release of cases or carriers

SECTION 2566.6. Whenever laboratory tests are required for the release of cases or carriers, the tests shall be taken by the health officer or his representatives and shall be submitted to a laboratory approved by the State Board of Public Health for such purposes. Specimens may be sent to laboratories not so approved, provided the specimens are divided and a portion of the specimens are sent to an approved laboratory. Release shall be considered on the basis of the report of the approved laboratory only.

Milk supply

SECTION 2566.7. When a milk supply is thought to be the source of infection for any one of the communicable diseases known to be transmitted through or suspected of being transmitted through milk, the health officer shall prohibit the sale of such milk until such time as he deems it to be safe for human consumption.

Cases on dairies

SECTION 2566.8. When a case of diphtheria is confined on the premises where a dairy is maintained, the health officer shall prohibit the sale of such milk until he is satisfied that such is safe for human consumption.

Public Health Nursing Responsibility

Teach content included in above sections.

Carry out health officer's instructions regarding the spacing of nose and throat cultures of contacts and patient.

Observe "Technique for Taking Nose and Throat Cultures for Diphtheria."

Teach procedures for: Disposal of nose and throat discharges, disposal of uneaten food, care of dishes, care of linen, terminal disinfection.

DYSENTERY, AMEBIC

(Amebiasis)

Recognition of the disease

Great clinical variation has been observed. Some of the common types are:

Acute amebic dysentery, with diarrhea of increasing severity, leading to dysentery with blood-and-mucus stools.

Chronic amebic dysentery, with periodic attacks of diarrhea or relatively mild dysentery.

Amebic colitis without dysentery, characterized by abdominal discomfort, sometimes diarrhea alternating with constipation and not infrequently symptoms simulating chronic appendicitis.

Etiologic agent

Endamoeba histolytica.

Source of infection

The cysts in bowel discharges of infected persons.

Mode of transmission

By eating contaminated foods, especially those that are commonly served cold and moist, and hand-to-mouth transfer of the infected material from moist objects soiled with discharges of an infected individual; by drinking contaminated water; and by flies.

Incubation period

From two days in severe infections to several months in subacute and chronic cases; commonly three to four weeks.

Period of communicability

During course of infection and until repeated microscopic examination of stools shows absence of the *Endamoeba histolytica* (either trophozoites or cysts). Direct transmission unusual.

Susceptibility and immunity

Susceptibility to infection is general; a considerable number of persons harboring the cysts develop recognized symptoms; no artificial immunity.

Prevalence

Not a common disease clinically recognized in continental North America. Epidemic outbreaks are rare. It is estimated that almost 5 percent of the population are carriers of cysts. More prevalent in the tropics and the Orient.

Methods of control

The infected individual, contacts, and environment

Recognition of the disease: Clinical symptoms confirmed by microscopic examination of stools. All cases of persistent diarrhea should be suspected.

Concurrent disinfection: Sanitary disposal of the bowel discharges. Hand washing after use of toilet.

Terminal disinfection: Cleaning.

Immunization: None.

Investigation of source of infection: Microscopic examination of stools of inmates of the household, and of other suspected contacts, should be supplemented by search for direct contamination of water and foods by human feces.

General Measures

Sanitary disposal of human feces.

Protection of potable water supplies against fecal contamination, and boiling drinking water where necessary. Chlorination of water supplies as generally used has been found inadequate for the destruction of cysts.

Supervision of the general cleanliness, personal health, and sanitary practices of persons preparing and serving food in public eating places, especially moist foods eaten raw. The routine examination of food handlers to eliminate carriers from such occupations is of little or no practical value.

Education in personal cleanliness, particularly washing hands with soap and water after evacuation of the bowels.

Control of fly breeding and protection of foods against fly contamination by screening.

Avoidance of cross connections between public and private auxiliary water supplies and of backflow connections in plumbing systems.

Adequate treatment of patients, and subclinical cases when discovered, with a view to eradication of the parasite. Effective amebicides for this purpose are now available.

Instruction of convalescent and chronic carriers in personal hygiene, particularly as to sanitary disposal of fecal waste, and hand washing after use of toilet.

Epidemic Measures

In case of epidemics due to relatively massive doses of infectious material, active measures should be employed to discover the source of infection, and to advise the public and the medical profession of the early and characteristic symptoms, of the serious immediate and remote results of such infection, and of the good results of treatment if instituted early.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of feces for cysts and trophozoites of *Endamoeba histolytica.*

Collection of specimens

Submit portions of feces from various parts of the stool in special container provided by the Division of Laboratories. (Special instructions for the collection of specimens accompany the container.)

Interpretation of results

Positive report: Organism demonstrated in *stained* preparation identified as *E. histolytica*-large or small race.

Negative report: No cysts or trophozoites of *E. histolytica* found. A single negative result is of little value. A series of at least six specimens should be submitted.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Section 2550. (a) The patient shall be isolated in accordance with Section 2518 until clinically recovered and feces specimens have been determined by the laboratory to be negative for this infection. Under ordinary circumstances, no control need be exercised over contacts.

(b) Individuals who are found to be excreting *Endamoeba histolytica* shall be excluded from public food handling until three feces specimens, taken at intervals of not less than three days, shall be proved negative for *Endamoeba histolytica.*

Public Health Nursing Responsibility

Teach content included in above sections, as well as the importance of:

a. Medical care for all cases of diarrhea.
b. Use of pasteurized milk in the home.
c. Method of collection of stool specimens.

Teach procedures for: Disposal of excreta, terminal disinfection.

DYSENTERY, BACILLARY

(Shigellosis)

Recognition of the disease

The disease exhibits an acute onset with diarrhea, in severe cases causing fever, tenesmus, and frequent stools containing blood and mucus. The milder cases are difficult to recognize clinically because of variability of symptoms. By adequate laboratory examination the infecting organism can usually be identified.

Etiologic agent

Various species of the genus *Shigella*, such as Flexner, Sonne, Shiga, and others.

Source of infection

The bowel discharges of infected persons and carriers. Healthy carriers are common.

Mode of transmission

By eating contaminated foods, or drinking contaminated water and by hand-to-mouth transfer of contaminated material; by flies; from objects soiled with discharges of an infected individual or of a carrier.

Period of communicability

During the acute phase of the disease and until the microorganism is absent from the bowel discharges. The stools usually become negative in a few weeks without specific therapy and in a few days under sulfonamide treatment.

Susceptibility and immunity

Susceptibility is general, but the disease is more common and more severe in children than in adults. A relative and transitory immunity follows recovery from the disease.

Prevalence

Endemic, epidemic, and sporadic, but shares with other enteric infections the characteristics of a striking and progressive reduction wherever water supplies are rendered safe, sewage is disposed of in a sanitary manner, milk is pasteurized, and infant hygiene is of a good order. Most common in the summer months. Institutional outbreaks are frequent.

Methods of control

The infected individual, contacts, and environment

Recognition of the disease, and reporting: Clinical symptoms confirmed by bacteriologic tests. Groups of cases of acute diarrheal disorder should always be reported to the health officer at once, even in the absence of exact determination of the nature of the disease.

Concurrent disinfection: Bowel discharges.

Terminal disinfection: Cleaning.

Immunization: No method of immunization has as yet proved satisfactory.

Investigation of source of infection: Important in epidemics; investigation of food, water, and milk supplies, general sanitation, and search for carriers may serve to detect the source and prevent further spread. For sporadic cases such investigation is time-consuming and gives meager results.

General Measures

Protection and purification of public water supplies, together with prevention of subsequent contamination.

Pasteurization of public milk supplies; use of boiled milk for infant feeding.

Sanitary disposal of human excreta.

Supervision of preparation and handling of all foods, particularly those which are moist and eaten raw.

Hand washing, by food handlers in particular, following use of toilet and before handling or eating food.

Prevention of fly breeding; screening.

Persons known to be infected, and their attendants, should be excluded from handling food for public consumption, and from handling the family food supply if possible.

The exercise of rigid precautions in known cases of bacillary dysentery is requisite but is inadequate as a safeguard against the ever-present risk of infection from unrecognized sources. Reduction of high infant mortality rates is dependent upon prevention of diarrhea and enteritis. Infant hygiene, including breast feeding, scrupulous cleanliness at all times in the preparation and handling of food for children, and continuous attention to diet will do much toward accomplishing this aim. As a precautionary measure, all cases of infantile diarrhea should be regarded as bacillary dysentery unless proved otherwise. Prevention of epidemics of bacillary dysentery by guarding against massive dissemination of infection should be a major concern, particularly in prisons, camps, and institutions.

A reduction in the incidence of the disease and carriers may be expected from the prophylactic oral administration of certain sulfonamides, sulfathaladine, succinylsulfathiazole, and sulfadiazine, under medical supervision in groups of persons exposed temporarily to a high risk of infection.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of feces by cultural methods for the various types of dysentery bacilli.

Serological typing of cultures.

Collection of specimens

Feces specimens: Use standard typhoid mailing container provided by the Division of Laboratories. Mark plainly condition suspected "Bacillary Dysentery" on accompanying report slip. Collect a sample of feces about the size of a sphere one-half inch in diameter, or, if stool is liquid, collect approximately 1-2 cc. and add to glycerine solution in bottle marked "Feces."

Cultures for serological typing: Local laboratories may submit cultures for typing. These cultures should be submitted on a sugar free medium (plain agar). Special containers for this purpose may be obtained upon request from the Division of Laboratories.

Interpretation of results

Feces specimens: Positive report: Preliminary report—Organisms isolated and identified serologically as a member of the genus *Shigella.* The species isolated will be given. Final report—Specific serological type will be indicated. (See paragraph on cultures for typing below.)

Negative report: No organisms isolated which resemble any of the dysentery group.

Cultures for typing: Whenever possible the specific serologic type will be given. Since this is a time-consuming procedure, final reports may be delayed. The type reported is of importance in establishing relationship to other cases or carriers of dysentery organisms.

The examination of blood specimens for agglutinin is not recommended because many persons may show confusingly high titers without evidence of infection. If, upon examination of repeated specimens, a significant rise in titer can be demonstrated, that fact may be helpful in establishing the diagnosis.

Under certain circumstances, the dysentery bacilli can be isolated from the blood stream, therefore, blood cultures may sometimes be of value, though they are not ordinarily recommended.

Blood specimens for agglutination and culture may be submitted to the laboratory in the same manner as for typhoid fever. The same standard containers should be used, and report slips should be plainly marked "For Bacillary Dysentery."

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Case

SECTION 2568(a). The period of isolation shall be until the acute symptoms have subsided and two specimens of feces taken successively at intervals of at least three days have been determined by the laboratory to be negative for bacillary dysentery bacilli. The patient shall not take any part in the preparation, serving, or handling of milk or other food to be consumed by individuals other than his immediate family; nor shall he participate in the management of a dairy or other milk distributing plants, boarding house, restaurant, food store, or any place where food is prepared or stored; until three successive feces specimens taken at intervals of at least three days have been determined by the laboratory to be negative for bacillary dysentery bacilli.

Contacts

SECTION 2568(b). No restrictions, except that no member of the household shall have any part in the preparation or serving of food to persons other than members of his immediate family; nor shall he engage in any occupation which brings him in contact with milk, milk products, milk bottles, or milk utensils. If members of the household are public food handlers and wish to resume their occupation, they shall leave the premises on which the case is isolated and submit at least two feces specimens to the health officer and prove to the satisfaction of the health officer that they are free from infection before resuming their occupation.

Milk supply

SECTION 2568(c). When a milk supply is thought to be the source of infection for any one of the communicable diseases known to be transmitted through milk or suspected of being transmitted through milk, the health officer shall prohibit the sale of such milk until such time as he deems it to be safe for human consumption.

Cases on dairies

SECTION 2568(d). When a case of bacillary dysentery is confined on the premises where a dairy is maintained, the health officer shall prohibit the sale of such milk until he is satisfied that such is safe for human consumption.

Carriers defined

SECTION 2568(e). Any person whose feces contains the bacilli causing this disease and who is not ill shall be reported as a carrier.

Any person who has been free from symptoms of this disease for one month, and whose feces contains the bacilli causing this disease, shall be reported as a *"convalescent carrier."*

Any convalescent carrier, whose feces continues to contain any of these bacilli after one year following clinical recovery, shall be reported as a *"chronic carrier,"* and any person whose feces contains any of these bacilli, but gives no history of recently having had the disease, shall be recorded also as a *"chronic carrier."*

Health officer's visits to carriers

SECTION 2568(f). The local health officer shall visit each carrier in his territory at least twice a year to check on the occupation, address, and other activities of the carrier, and to determine if all instructions are being carried out.

Carrier restrictions

SECTION 2568(g). When any known or suspected carrier of this disease is reported to or determined by the local health authority, he shall make an investigation, submit a report to the State Department of Public Health and obtain second specimens of feces to be submitted to the Division of Laboratories, State Department of Public Health, for confirmation. Any known or suspected carrier of this disease shall be subject to modified isolation, and the provisions of this isolation shall be fulfilled during such period as he complies with the instructions issued by the State Department of Public Health and the local health officer. Such instructions shall be given to the carrier in writing by the local health officer and shall include the following requirements:

(1) The individual shall not have any part in the preparation, serving or handling of food which may be consumed by any person other than members of his immediate family; nor shall he be engaged in any occupation which brings him in contact with milk, milk products, milk bottles, or milk utensils; nor shall he participate in the management of a dairy or other milk distributing plant, boarding house, restaurant, food store, or any place where food is prepared or served; nor shall he reside on the premises of any such food handling establishment.

(2) The carrier shall wash his hands thoroughly with soap and hot water and a nail brush after using the toilet and before handling food in his home.

(3) If the premises on which the carrier resides is provided with an outdoor privy, the carrier shall have on hand at all times an adequate supply of quicklime and use it as instructed. The privy shall be kept at all times in a sanitary condition and screened against flies.

(4) The carrier shall keep the local health officer informed at all times of his address and occupation, and notify the health officer at once of any contemplated change in his address or occupation.

(5) The carrier shall communicate with the health officer before submitting to any type of treatment intended for the cure of the carrier condition.

(6) He shall report to the health officer immediately any cases of illness suggestive of dysentery in his family or among his immediate associates.

(7) The carrier shall not live or work upon the premises of a dairy except with the written permission of the Director of the State Department of Public Health.

Requirements for release of carriers

SECTION 2568(h). Carriers of bacillary dysentery bacilli shall not be released from restrictions until at least five successive negative feces specimens taken at not less than weekly intervals have been obtained.

Release of chronic carriers

SECTION 2568(i). If, after all requirements cited in Section 2568(h) have been met to the satisfaction of the Director of the State Department of Public Health, he may grant a release to the individual if he feels that the person is no longer a menace to the public health.

Laboratory tests

SECTION 2568(j). Whenever laboratory tests are required for the release of cases or carriers, the tests shall be taken by the health officer or his representatives, under such conditions that he can certify as to their being authentic specimens of the individual, and shall be submitted to a laboratory approved by the State Board of Public Health for such purposes. Specimens may be sent to laboratories not so approved, provided the specimens are divided and portions of the specimens are sent to an approved laboratory. Release shall be considered on the basis of the report of the approved laboratory only.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

a. Value of medical care for any case of diarrhea.
b. Demonstrate preparation of infant feeding where hazards (flies, raw milk, poor home sanitation) are noted.
c. Teach attendant how to collect feces specimens for laboratory examination.

Teach convalescent patients and carriers their responsibility in prevention by practicing good personal hygiene.

Teach procedures for: Care of linen, disposal of excreta, terminal disinfection.

ENCEPHALITIS, INFECTIOUS

Recognition of the disease

Laboratory more important than clinical diagnosis. At least four forms have occurred in the United States: the Vienna type (originally called lethargic or von Economo, later called type A), the St. Louis type, the eastern equine type, and the western equine type. The last three resemble each other and the Japanese type B (which is not known to occur in the United States) more than any of them resembles the Vienna type.

The Vienna type is the most chronic and variable in course, often with a mild febrile onset, later with symptoms of brain or nerve involvment, such as slight meningeal irritation, somnolence, diplopia or evident paralysis of eye muscles, insomnia, restlessness, twitching, myoclonia, catatonia, with or without fever; and still later at times, slow, semi-rigid movements, coarse tremor, masklike expression or other disturbances of motility, psychic or behavior disturbances, often with exacerbations and remissions over several years.

Though an individual case of the St. Louis type may be indistinguishable from the Vienna type, in the St. Louis type the onset is usually more abrupt as to fever or headache, with drowsiness rather than deep sleep, disorientation, motor disturbances but very infrequent paralysis of the eye muscles, meningeal irritation with an increase of cells in the spinal fluid more commonly than in the Vienna type, and usually complete and fairly prompt recovery in the nonfatal cases.

All ages are attacked in all four types, children and young adults more frequently in the Vienna type, the older ages in the St. Louis (and Japanese B) type, very young children in the eastern equine type, males more frequently in the western equine type. The western equine type is somewhat similar clinically to the St. Louis type, while the eastern equine type has been a more severe and fatal disease in humans and is likely to leave nervous and mental sequellae in the patients who survive. These forms of encephalitis are to be distinguished from post- or para-infectious encephalitis which follows or accompanies such infections as measles, vaccinia, and chickenpox, by the history of the other infection immediately preceding.

Etiologic agent

Probably a virus for the Vienna type: a specific filterable virus for each of the other types.

Source of infection

Unknown. Birds are a probable reservoir of infection for the equine types.

Mode of transmission

In the case of the equine and the St. Louis types of encephalitis, several species of mosquitoes have been shown to be capable of transmitting one or more of the viruses and mosquitoes are probably the important natural vectors.

Incubation period

Four to 21 days for the St. Louis type.

Period of communicability

Unknown.

Susceptibility and immunity

Natural immunity and immunity resulting from an attack are assumed to occur, but have not been proved except by the ability of the blood serum to neutralize viruses of the St. Louis, eastern and western equine types, Japanese B, Venezuelan, and West Nile infections.

Prevalence

The Vienna type was first distinctly recognized in 1917, but had occurred before, and has since been prevalent in many parts of the world, especially from 1920 to 1926; and infrequently now. The St. Louis type was especially prevalent in the St. Louis area in 1933, where there was an incidence of 100 per 100,000 population, but this type has occurred elsewhere before and since in California. The Vienna type occurs at all seasons of the year but more frequently in late winter and spring. The other types occur notably in late summer and fall.

Methods of control

The Infected Individuals, Contacts, and Environment

Recognition of the disease: Clinical symptoms, assisted by microscopic and chemical examination of the spinal fluid. Virus has been isolated from the brain tissue of fatal cases of all types except the Vienna type. Development of specific neutralizing antibodies in the blood serum of patients may be an aid to identification of the type if suitable laboratory facilities are available.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Search for prior cases in the community and for unreported cases among the associates of the patient may develop useful epidemiologic information, but so far has been of no practical value in control of the different types of this disease.

General Measures

Mosquito control directed toward suspected vector species if practicable.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Neutralization and complement fixation tests on patients' serum for antibodies to the infectious agent.

Isolation of virus from brain specimens, humans and animals.

Collection of specimens

Blood for neutralization tests: Two specimens of serum are necessary. The first should be taken as soon as possible after the onset, and the second 14-21 days after the first. Collect approximately 20 cc. venous blood aseptically and send in a sterile vial. Containers will be supplied on request to the Division of Laboratories. Tests will not be run on single specimens as they are of no diagnostic significance unless a rise in titer can be demonstrated.

Tissues for virus isolation: Generous blocks of (1) temporal lobe including the hippocampus, (2) motor cortex, (3) midbrain, (4) thalamus, (5) pons and medulla, (6) cerebellum, (7) upper inches of cervical cord, collected aseptically in sterile rubber stoppered or air-tight containers and without preservative. Ship packed in dry ice. *(Important to pack specimen in dry*

ice immediately after collection. Must not thaw before reaching the laboratory.)

For all specimens, complete accompanying report slip, being sure to give *date of onset, disease suspected, date of specimen,* and, for blood, whether first or second specimen. These data are essential to performance and interpretation of the tests.

Interpretation of results

Neutralization tests: Positive reports: Dependent on demonstrating the absence of antibodies in the acute phase specimen and presence of antibodies in the convalescent phase specimen, or an increase in antibodies in the convalescent phase specimen over the antibody content of the acute phase specimen. If antibodies are present and in the same amounts in both specimens, the antibodies are due to a previous infection or to the first specimen having been collected too late after onset.

Isolation of virus: Positive report: Virus isolated and identified.

Negative report: No virus isolated or detected by available laboratory methods.

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Case

SECTION 2570 (a). The patient shall be isolated for seven days from the onset in a room satisfactorily screened against insects.

When there is doubt on the part of the health officer as to whether the case is one of poliomyelitis or infectious encephalitis, the control measures instituted should be the same as for poliomyelitis.

Contacts

SECTION 2570 (b). No restrictions when the patient is properly isolated.

Public Health Nursing Responsibility

Teach content included in above sections.

In rural areas where equine encephalitis is found emphasize:

a. Mosquito control in homes and home screening.

b. Importance of immunization of horses and mules.

EPILEPSY

(And Chronically Recurring States of Unconsciousness)

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Definition

SECTION 2572. As required in Section 211 of the Health and Safety Code, the definition as to what shall constitute a reportable case of epilepsy shall be as follows:

Any condition which brings about momentary lapses of consciousness and which may become chronic shall be considered reportable under the term epilepsy.

Public Health Nursing Responsibility

Teach importance of:

a. Consistent medical supervision.
b. Use of medicines and diets as prescribed.
c. Hygienic habits of posture and sleep.
d. Avoidance of emotional upsets.
e. Avoidance of alcoholic beverages.

Teach the patient his responsibility to other people. (He must refrain from driving an automobile or other vehicle. He should not be employed where he is required to operate machinery.)

Attempt to dispel misconceptions and remove stigma commonly associated with the disease.

Reassure the family and teacher, if a school child, that the patient is unlikely to die during a seizure.

Demonstrate care during a seizure if possible:

a. Emphasize need for calmness.
b. Allow patient to remain where he falls until convulsions have ceased, making him as comfortable as possible.
c. Create environment which will prevent injuries:
    1. Head injury: Put something soft under head if patient tends to beat head against floor.
    2. Tongue biting: Insert wooden spoon or folded towel between teeth. Avoid use of any metal objects between teeth, since patients frequently break their teeth on them.
    3. Swallowing tongue: Pressure under jaw on either side of trachea keeps tongue from falling back into throat. If this is ineffective, the tongue may be grasped and held in place with a piece of cloth between fingers and tongue.

If patient is considering marriage urge him to discuss it with his physician.

Refer patients and their families to the American Epilepsy League, 50 State Street, Boston, Massachusetts, where they may obtain selected scientific literature on the disease.

FAVUS

Recognition of the disease

A parastic fungus disease of the skin, usually on the scalp, marked by cup-shaped yellowish crusts covering the hair follicles, verified by microscopic and cultural observation.

Etiologic agent

Trichophyton schoenleini (Achorion schoenleini).

Source of infection

Lesions of skin, particularly of scalp, rarely of nails.

Mode of transmission

Direct contact with patient, and indirectly through toilet articles.

Incubation period

Unknown.

Period of communicability

Until skin and scalp lesions are all healed as shown by absence of scaling and erythema, to be confirmed by microscopic examination, culture, and absence of fluorescence under a suitable ultroviolet light.

Susceptibility and immunity

Infection by this fungus is frequent with the presence of another patient in the family, and with neglect of personal cleanliness. Susceptibility general among children. Immunity is not known to exist.

Prevalence

Rare in children in North America, and when occurring can usually be traced to immigrants from southern and eastern Europe.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical symptoms confirmed by microscopic examination of crusts, and cultures on Sabouraud's medium.

Isolation: Exclusion of patient from school and other public places until lesions are healed. Patient should wear a light tight-fitting cotton skull cap constantly. This must be changed frequently and boiled.

Concurrent disinfection: Toilet articles of patient.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Search for unreported and unsuspected cases among immediate home or play or work associates of the patient.

General Measures

Elimination of common utensils, such as hair brushes and combs.

Provision for adequate and intensive treatment and cure of cases of favus at hospitals and dispensaries, to abbreviate the period of communicability of the patient.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

FILARIASIS

(Mumu)

Recognition of the disease

Not known in California.

Characterized by early and late stages: *Early (acute)* stage typified by acute symptoms with lymphadenitis and retrograde lymphangitis (particularly of the extremities and spermatic cords), accompanied by febrile phenomena and lethargy. If prolonged or repeated reinfection occurs, the patient may develop the *late (chronic)* stage of which elephantiasis and chyluria are manifestations. The embryos (microfiloria) may or may not be found in the circulating blood as long as two or three years after infection occurs and rarely prior to nine months, but may be found indefinitely after once observed for as long as the infection persists. When microfilaria *(W. bancrofti)* are present in the circulating blood, they may appear principally in the blood taken between 10 p.m. and 2 a.m. or they may appear diurnally. This tendency to periodicity of appearance varies with geographic locations. The finding of microfilaria in the blood stream cannot be relied upon for early acute-phase diagnosis.

Etiologic agent

A nematode worm. Several species of filariids are known to infect man; filariasis is most commonly caused by *Wuchereria bancrofti.*

Source of infection

The blood of an infected person.

Mode of transmission

In North America has been transmitted by the mosquito *Culex quinquefasciatus.* Other species of mosquitoes including Anophelines have been incriminated in other parts of the world. After the mosquito takes a blood meal from a person with circulating filaria embryos, the embryos develop in the mosquito into infective larvae in 14 to 21 days. Transmission is by the bite of the mosquito.

Incubation period

Embryo filariae are not found in the blood until at least nine months after infection; symptoms may appear from one month to several years later.

Period of communicability

In man, as long as the embryos (microfilariae) are present in the blood. In the mosquito, 14 to 21 days after larvae have developed and are present in its head, salivary glands, and proboscis.

Susceptibility and immunity

As far as is known, all persons are susceptible and no immunity develops.

Prevalence

Previously reported cases were limited to Charleston, S. C. This focus of infection no longer exists. Common in certain tropical and subtropical parts of the world.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease.

Isolation: Not practicable.

Quarantine: None.

Immunization: None.

Investigation of source of infection most important. Surveys of incidence and range in endemic foci.

Antimosquito measures should be undertaken against the transmitting mosquito, particularly in endemic areas. In the case of *Culex quinquefasciatus*, the mosquito generally breeds in filthy locations such as in septic tanks, collections of rain water in tin cans, etc. Screening of sleeping places of considerable value because *Culex quinquefasciatus* usually feeds at night.

General Measures

Education of the public concerning the mode of transmission of filariasis and methods of mosquito control.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of blood.

Microscopic examination of fluid from enlarged lymph nodes.

Collection of specimens

Thick blood films should be prepared as directed for "Malaria." Malaria mailing outfits may be used but report slip should be plainly "For Filiaria." Consult the Division of Laboratories for instructions for collecting specimens for fresh blood or fluid from lymph nodes. Special mailing outfits will be provided upon request. It is estimated that the microfilariae of the "periodic" strain of *Wuchereria bancrofti* can be found in greatest abundance from 10 p.m. to 2 a.m.

Interpretation of results

Positive report: Microfilaria were observed in the blood smear.

Negative report: No microfilaria observed.

NOTE: Whenever possible a differential count should be done since an eosinophilia in the absence of helminth infections may be of diagnostic aid.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

FOOD POISONING

I. FOOD INFECTIONS

(Salmonellosis)

Recognition of the disease

Onset acute, usually with diarrhea as the chief symptom, abdominal cramps, fever; occasionally nausea and vomiting; diarrhea usually persists several days. Examination of feces may reveal infecting organisms.

Etiologic agent

A variety of members of *Salmonella* group: Most common in the United States are *Salmonella typhimurium (aertryeke)*, *S. enteritides*, and *S. cholerae suis (suipestifer)*.

Source of infection

Usually animal sources. Rodents often infected, spread infection through droppings; meat of infected cattle and other livestock (including ducks and turkeys); and powdered eggs. Feces of patients and convalescent carriers; chronic carriers rare.

Mode of transmission

Contamination of food through droppings of infected rodents; consumption of meat infected animals, rarely ducks' eggs. Contamination of food, especially pastries, or milk, through fecal contamination of hands of food handlers.

Incubation period

Six to 48 hours, usually about 24 hours.

Period of communicability

Throughout illness. Secondary cases uncommon.

Susceptibility and immunity

Susceptibility is general. No evidence of lasting immunity after infection.

Prevalence

Many cases of "common diarrhea" are in reality *Salmonella* infections; most commonly recognized following banquets or other meals of groups of persons; apparently less common in the United States than in Western Europe where many infections have been traced to meats and ducks' eggs and fewer to rodents.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms confirmed by bacteriologic examination of bowel discharges, rarely of blood and urine; agglutination tests are of little value. Rarely reported except when groups of related cases occur.

Isolation: Exclusion from food handling and occupations involving the care of children until clinical recovery.

Concurrent disinfection: Disinfection of all bowel discharges and of articles soiled by them.

Terminal disinfection: Cleaning.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Actual or probable source should be determined, especially if it appears to involve public food-handling establishments; examination of suspected food is desirable.

General Measures

Elimination of rodents and other vermin from food-handling premises.

Strictest possible attention to refrigeration and to cleanliness of food-handling premises and practices. Stress should be put on cleanliness of hands of food handlers and on protection of foods from vermin during processing and storage.

Food handlers should not be permitted to work while suffering from diarrhea.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Blood cultures.
Agglutination tests on blood specimens.
Cultures of feces and urine specimens.
Serologic typing of cultures.

Bacteriological examination of suspected food for organisms of the genus *Salmonella.*

Collection of specimens

Feces and urine specimens: Collect a portion of the stool approximately the size of a sphere one-half inch in diameter and emulsify it in glycerin solution contained in bottle marked "Feces," which is provided in the standard feces and urine mailing outfit supplied by the Division of Laboratories. If stool is liquid, collect 1-2 cc. and add to the glycerin solution.

Collect 2-3 cc. urine and add to glycerin solution in bottle marked "Urine." Mark plainly on accompanying report slip condition suspected "Salmonella Infection."

Blood cultures: During the first 10 days of the disease, collect approximately 5 cc. venous blood aseptically, and place in special bottle containing bile medium which will be found in the standard typhoid agglutination and blood culture mailing outfit provided by the Division of Laboratories. Mark plainly condition suspected "Salmonella Infection."

Blood for agglutination: At the same time blood is taken for culture, collect 5 cc. for agglutination test. Place in sterile vial provided in standard typhoid agglutination and blood culture mailing outfit supplied by the Division of Laboratories. Mark plainly on accompanying report slip condition suspected "Salmonella Infection."

Cultures for serologic typing: Should be submitted as soon after initial isolation as is possible. They should be sent on a solid, sugar free medium (plain agar). Special containers will be supplied upon request to the Division of Laboratories. Information as to source of organism should be stated. Mark plainly accompanying report slip "For Salmonella Typing."

Suspected food for examination: Send suspected food to laboratory in suitable containers; accompany by description of symptoms and probable incubation period.

Interpretation of results

Feces and urine cultures: Positive report: Preliminary report—An organism other than *E. typhosa* and appearing to

belong to the genus *Salmonella* has been isolated. Final report—The specific serologic *Salmonella* type will be given.

Negative report: No organism resembling any known members of the *Salmonella* group isolated.

Blood culture: Positive report: Preliminary report—Organism other than *E. typhosa* and appearing to belong to the genus *Salmonella* has been isolated. Final report—The specific serologic *Salmonella* type will be given.

Negative report: No organism resembling members of the genus *Salmonella* were isolated or no growth obtained from blood culture.

For early diagnosis, a blood culture is a diagnostic aid. It should be taken during the first week of illness after which the organisms usually disappear from the blood stream. However, in case of negative findings, repeated specimens may be desirable. Isolation of a *Salmonella* species establishes the cause of the illness.

Agglutination tests: Positive report: Agglutination obtained in titer 1-80 or higher.

Negative report: No agglutination or titer below 1-80.

Agglutinins do not usually appear in the blood until 10-14 days after onset. The titer reaches its height during the third week of illness. Agglutinins produced as a result of a previous infection or of prophylactic vaccination may persist for an indefinite period of time. Therefore, their presence in low titer especially, cannot in itself be considered diagnostic, but must be viewed in the light of clinical findings and past history of patient. A rise in agglutinin titer should be of diagnostic aid. Therefore, in case of negative findings or agglutinin in low titer, repeated specimens are recommended.

Cultures for serologic typing: Positive report: The specific *Salmonella* species will be given.

Negative report: Organism does not conform culturally or serologically with any of the known types of *Salmonella.*

Suspected food: Positive report: Preliminary report—Organism resembling a *Salmonella* species isolated. Final report—Specific serologic type will be indicated.

Negative report: No organisms isolated resembling the *Salmonella* species.

II. BACTERIAL INTOXICATIONS

A. STAPHYLOCOCCUS

Recognition of the disease

A poisoning (not infection) of abrupt onset, sometimes violent, with severe nausea, vomiting, and prostration, severe diarrhea in some cases. Only satisfactory confirmatory test is isolation of staphylococci from suspected food and proof of toxigenic capacity through feeding of filtrates to human volunteers or injecting filtrates into kittens.

Etiologic agent

Toxin (enterotoxin) of certain strains of hemolytic staphylococci. Toxin is stable at boiling temperature; staphylococci do

not produce intestinal infection but multiply in food, producing a toxin which is the cause of poisoning.

Source of infection

Not known in most cases; believed to be of human origin.

Mode of transmission

Most common vehicle is custard-filled pastry; processed meats, especially ham, responsible for some outbreaks; outbreaks reported due to milk from cows with specifically infected udders.

Incubation period

The interval between taking food and onset is one-half hour to four hours, usually two to four.

Period of communicability

None.

Susceptibility and immunity

Most persons are susceptible, though an occasional person seems to be immune.

Prevalence

Widespread; probably the principal cause of acute "food poisoning."

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Diagnosis usually made only on the basis of the grouping of cases and the brevity of the interval between eating food and the onset of symptoms; isolation of staphylococci from suspected food is ground for presumptive diagnosis but not conclusive unless ability of organism to produce enterotoxin can be shown. All suspected cases should be reported.

Isolation: None.

Concurrent disinfection: None.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Search for food contaminated with staphylococci, and for food handlers showing pyogenic skin infections or upper respiratory symptoms.

General Measures

Temporary exclusion from food handling of persons suffering from pyogenic skin infections, especially those of hands.

Prompt refrigeration of sliced and chopped meats and of custards and cream fillings, to avoid multiplication of staphylococci accidentally introduced; filling of pastries with custard immediately before sale; or adequate heat treatment of the finished product.

Some health authorities have forbidden sale of custard-filled products during summer months.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Bacteriologic examination of suspected food samples for presence of toxin producing staphylococci.

Collection of specimens

Send suspected food to laboratory in suitable containers; accompany by description of symptoms and probable incubation period.

Interpretation of results

Positive report: Staphylococci isolated which conform to the cultural pattern of enterotoxogenic staphylococci.

Negative report: No staphylococci of the enterotoxogenic type were found.

B. BOTULINUS

(Botulism)

Recognition of the disease

A disease due to a specific toxin, the symptoms of which develop suddenly with gastrointestinal pain, diarrhea, or constipation, prostration, and a variety of central nervous system paralyses, the first of which is likely to be an oculomotor paralysis, all due to the toxin of the particular saprophytic organism. Biologic and toxicologic tests with laboratory animals may confirm presence of toxin of the botulinus bacillus in the food; and in the serum and vomitus of patient.

Etiologic agent

The toxin produced by the botulinus bacillus *(Clostridium botulinum, Cl. parabotulinum)* in food improperly processed.

Source of infection

(Not an infection but a poisoning.) Food usually taken uncooked from cans or jars not subjected to adequate heat of sufficient duration or under sufficient pressure during the processing.

Mode of transmission

Only by eating food containing the botulinus toxin.

Incubation period

Symptoms appear almost always within 24 hours after taking the particular food product, possibly longer, the interval being determined by the amount of the contaminated food taken and its botulinus toxin content.

Communicability

This term does not apply. The disease is not conveyed from man to man, or among animals, except as food containing the botulinus toxin is consumed by them.

Susceptibility and immunity

Susceptibility is general. The symptoms develop according to the amount of toxin ingested in relation to body weight of the person. Antitoxins will protect persons who have taken contaminated food but who have not yet developed symptoms.

Prevalence

Sporadic cases and groups of cases occur in all countries and always in relation to some perishable food product which permits the development, under partially anaerobic conditions, of *Cl. botulinum,* and its toxin. In the United States the disease has in recent years followed most commonly the use, without further or adequate cooking, of home-canned vegetable and meat products.

Methods of control

Governmental control by regulation and inspection of commercial processing of canned and preserved foods.

Education of housewives and others concerned with home canning of foods in the essentials of safe processing, as to time, pressure, and temperature factors.

Education in value of boiling home-canned green and leafy vegetables before serving, and the thorough cooking of sausage and other meats and fish products held for later consumption.

Immunization

Cases or suspected cases should be reported *at once* to *State Department of Public Health. If a commercial product is impli-*

cated, telephone or telegraph to the State Department of Public Health. All foods suspected of being the source should be held for laboratory examination. Keep opened foods under refrigeration.

Antitoxin for treatment

Antitoxin for treatment is available and should be administered as soon as botulism is suspected. Antitoxin may be obtained *day* or *night* from the *State Department of Public Health, 760 Market Street, San Francisco. Phone direct to: UNderhill 1-8700, Ext. 806, or medical officer on call.*

In instances where the costs cannot be met by the individual or the local department of health, the *health officer* is authorized to provide the antitoxin at the expense of the State Department of Public Health. The State Department of Public Health should be notified at once of any such commitment.

Who should be immunized

Passive immunity can be obtained for those who have eaten the suspected foods but not yet developed any symptoms by the intramuscular injection of 2,500 to 5,000 units of antitoxin. If any symptoms develop treat with full therapeutic doses intravenously.

Caution: Because the antitoxin is made from horse serum, always test sensitivity before administration.

Antitoxin

Antitoxin comes in 14.5 cc. ampules which contain 10,000 units each of Type A and Type B. To be effective, sufficient amounts must be administered as soon as possible. Use any facilities that you can enlist for rapid transportation of the serum.

Intravenous

One ampule (20,000 units) should be injected intravenously as soon as possible and repeated every four hours until the toxic condition is alleviated. Even cases of moderate severity may require several ampules, and severe cases will require more. There is considerable evidence that the antitoxin is more effective if it is given early and if combined with a 5 percent glucose solution which can be started before the antitoxin is available.

Intramuscular

At least two ampules (40,000 units) should be given *intramuscularly* if this route of injection is necessary.

General treatment

Bed rest, exclusion of visitors, forcing of fluids if there is no pharyngeal paralysis, complete evacuation of intestinal tract unless such a procedure is too fatiguing. Intravenous nourishment is preferred over gavage feeding. Suction aspiration to keep the pharynx clear of salivary collections is frequently necessary. Keep the *Drinker* respirator in mind whenever respiratory depression is complete or when respiratory stimulants and oxygen are ineffective.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of suspected food material for the presence of the toxin of *Clostridium botulinum.*

Collection of specimens

Send suspected food, serum or vomitus to the laboratory in suitable container. Send the original container if possible. Sub-

mit a description of clinical symptoms and give probable incubation period. State if botulism is suspected.

Interpretation of results

Postive report: Botulinus toxin has been demonstrated by animal inoculation; the specific type will be stated.

Negative report: No toxin was demonstrated in the suspected food or in cultures made from the suspected food.

C. SHELLFISH

(Mussel Poisoning)

A summary by Hermann Sommer, Ph.D., and K. F. Meyer, M.D.
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San Francisco, California

The paralytic form of shellfish poisoning, or "mussel poisoning" for short, is a severe form of food intoxication caused by eating mussels or clams at certain times of the year.

Source of poison

The original source of the poison is found in a unicellular microscopic organism of the ocean, the dinoflagellate *Gonyaulax catenella*. It is a free-swimming organism, multiplying by formation of chains of two, four or even eight individuals, of dark orange or greenish brown color, and living, like a true plant cell, by photosynthesis. Like all plankton organisms it is most abundant in the summer; at times it may multiply to as large a number as 40 millions per liter. At such times the water may, for miles, present a deep rust red color, the so-called "red water," in daytime, and a beautiful luminescent spectacle at night. Needless to say, other dinoflagellates or diatoms may present similar pure culture developments in the ocean without being poisonous. *Gonyaulax catenella* may vary considerably in its poison content; even a small number which is not visible as red water may be sufficient to cause dangerous conditions in shellfish. It occurs along the open ocean shore, less in inclosed bays and estuaries, from Alaska to Southern California. It has been tentatively identified in the North Atlantic Ocean (Nova Scotia and Belgium). The strong radiation of the sun together with the cold nutrient waters due to the upwellings along the Pacific Coast in summertime seem to be the ideal conditions for the growth of this dinoflagellate.

The poison

The poison contained in this organism is one of the strongest known. It belongs to the class of alkaloids, such as strychnine, muscarine and aconitine. It is heat-stable in acid or neutral solution, but is gradually destroyed by boiling with alkali. It is readily soluble in water and alcohol, insoluble in ether or chloroform. About one-millionth of a gram is sufficient to kill a mouse on injection; the fatal dose by mouth for a man is probably a few milligrams. The toxic principle has not been isolated in a crystalline state but has been purified to a high degree in the form of its hydrochloride.

Toxicity in shellfish

The plankton serves as a food for many animals of the seashore, including the bivalves. After the mussels ingest the plankton the Gonyaulax poison is stored in their digestive glands. The poison is not harmful to the mussels. The resulting toxicity is proportional to the number of Gonyaulax ingested

and to their poison content. If a large number of Gonyaulax is present in the water the toxicity of the mussels may rise to dangerous levels within a few days. In the absence of the organisms the stored poison is slowly excreted by the mussels in the course of several weeks. The muscular tissue (white meat) of the shellfish does not contain much poison; practically all of it is concentrated in the digestive gland (the dark central portion of the mussel).

Shellfish affected

All plankton feeders may at times become poisonous. The ones which reach dangerous levels of toxicity and may therefore become a public health problem are mussels and clams. Ocean mussels *(Mytilus californianus)* have caused most of the cases. The large varieties of clams which live near the open Pacific Coast, the Washington and the Pismo clams, are also responsible for several fatalities. The other varieties of clams and the Pacific oyster have never caused any cases although the poison has been demonstrated in most of them. Only shellfish whose habitat is far from the open ocean, such as soft-shell clams and native oysters, are entirely free of poison. Abalones as well as crabs do not feed on plankton, nor are their viscera consumed; for both these reasons there is no danger of shellfish poisoning from this sea food.

Distribution

Shellfish poisoning is by no means of recent origin. It has been known and recognized in Europe for over 100 years. The first outbreak recorded from the Pacific Coast in white people took place in the exploring party of Captain Vancouver in 1793 near the island which now bears his name. Since 1927 the records for the Pacific Coast show 409 cases of mussel and clam poisonings, with 35 deaths. Most of these occurred along the central California Coast, with a sprinkling of severe outbreaks from Juneau, Alaska, to Southern California and the Gulf of California, Mexico. All cases occurred between the fifteenth of May and the twenty-sixth of October. In July, 1936, an outbreak with two deaths occurred from mussels of the Bay of Fundy, Nova Scotia.

Considering the large amount of shellfish consumed, even in summertime, the incidence of paralytic shellfish poisoning is, no doubt, exceedingly small; but the dangerous nature of the poison and the high mortality make it a serious public health problem.

Symptoms

The symptoms of mussel poisoning in man or animal are entirely of nervous origin and may set in immediately after the meal. A prickly feeling in the lips, the tongue and the finger tips, followed by numbness are the first signs of intoxication. An ataxic gait and muscular incoordination, and finally ascending paralysis mark the progress of the intoxication, with death from respiratory failure in from 2 to 12 hours after consumption of the toxic shellfish. Symptoms of the alimentary canal are rare, with exception of vomiting which may occur in severe cases. Small amounts of poison, which are commonly ingested during times of low toxicity, apparently have no effect on the human body.

Diagnosis

The diagnosis of the paralytic form of shellfish poisoning is, therefore, not difficult, particularly if the history is known. Suspected shellfish material or stomach contents should be sent, in alcohol, through the local health department, or directly to the State Health Department in Berkeley or the Hooper Foundation in San Francisco, for confirmatory tests. There is no simple visual test by which toxic shellfish may be distinguished from harmless ones. Inoculation of extracts into mice is the most reliable testing method. Another simple and dependable test consists of feeding shellfish viscera to kittens. If the kittens do not die in a few hours, provided they retain the food, the shellfish can be eliminated as the cause of poisoning in humans.

Treatment

No specific treatment or antidote for mussel poisoning is known. Therapy can be only symptomatic and should follow the course of treatments in other alkaloid poisonings. Experience during the 1939 outbreak has shown that provocation of active vomiting by apomorphine is more effective in removing pieces of shellfish from the stomach than lavage. Mussel poison is strongly absorbed on charcoal, Lloyd's reagent and similar absorbents. Alkaline fluids are indicated considering the instability of the poison in that medium. In severe cases artificial respiration should be resorted to.

Prevention

The prevention of shellfish poisoning should be educational and legislative. The plain fact that the viscera of any bivalves during summertime may be a potential source of poison should be readily understood. Therefore a safe rule is: *Do not eat the viscera (dark meat) of, nor drink the juice from mussels, clams or similar shellfish from the open Pacific Coast between the first of May and the first of November.* The white meat must be thoroughly washed before cooking. The addition of baking soda in cooking shellfish, which has been advocated, helps to reduce the toxicity but is no safeguard against poisoning if highly toxic whole shellfish are prepared.

For the past 12 years the Health Department of the State of California has taken measures to prevent the occurrence of shellfish poisoning. Mussels being the most common source of the poison are put under quarantine from May 1st to October 31st, and at such other times as laboratory tests show them to be dangerous. Clams of a certain locality are quarantined only when findings in the field or the laboratory have demonstrated highly toxic mussels nearby. It has never been found necessary to quarantine bay mussels *(Mytilus edulis)*, mud clams or oysters.

During the poison season of 1939 it was proven beyond doubt that *warning signs posted along the beaches and across the highways at county lines have a decided effect in reducing the number of cases of poisoning.* The same applies to publicity in the local press and through radio stations along the coast. The health officer or local physician has an excellent opportunity to dispel in the minds of the people the many erroneous notions concerning the cause of mussel poisoning. It should be emphasized that: (1) The paralytic shellfish poison is no post-mortem

product. (2) Temporary exposure to the sun does not harm living mussels, nor does it make them poisonous. (3) Mussels below the tide line are, if anything, more poisonous than those above the water. (4) Copper in the rocks, oil on the beaches, and stagnation or pollution of the water are in no way connected with mussel poisoning. (5) Toxic mussels or clams cannot be distinguished from normal ones without animal tests. (6) Discoloration of a piece of garlic or of a silver spoon in the pot are no indicators for poisonous mussels.

Instead, the *simple story of the "chain intoxication,"* from the microscopic plant through the coldblooded animal to man, should readily find its way into the minds of the people along the coast and help to clear up this type of food poisoning.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

The livers of clams or mussels suspected of containing shellfish toxin.

Collection of specimens

Four or five mussels and/or three or four clams are selected from a given locale. The dark-colored portions (gastrointestinal organs) are removed from the shellfish and placed in bottles containing acidulate methyl alcohol to maintain an acid reaction (the toxin deteriorates in an alkaline medium) and to preserve the sample from spoilage. Containers are supplied by the Division of Laboratories or may be secured from county health officers. The following data should accompany each sample:

Location
Kind of shellfish
Number of shellfish
Time collected (date and hour)
Name of collector

Interpretation of results

Positive: Suspension of material inoculated intraperitoneally in mice produces typical symptoms and death of the animal within 20 minutes. The number of mouse units of toxin per shellfish liver will be reported.

Negative: If two mice survive the inoculation of liver material for a period of 20 minutes. Mild nonfatal symptoms, general paralysis resulting from other than the true shellfish toxin, or a total absence of symptoms, indicate a negative report.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Food Poisoning (Including Botulism)*

Section 2574. The health officer shall make an immediate investigation of all suspected cases in an effort to determine the source and cause. In the event that a commercial product is suspected, the health officer shall notify the State Department

* Section 2574 of the Regulations applies to all diseases included under "Food Poisoning" section of this bulletin, i.e., Food Infections (Salmonellosis) and Bacterial Intoxications—Staphylococcus and Botulinus (Botulism).

of Public Health at once (by telegraph or telephone when botulism is suspected), and hold all such specimens for examination in a laboratory approved by the State Department of Public Health.

The definition as to what shall constitute a reportable case of food poisoning shall be as follows:

a. Poisoning from organic poisons present in normal animal and plant tissues, including mushrooms, fish, and mussels.
b. Poisoning following the consumption of food into which mineral or organic poisons or preservatives, including arsenic, lead, cadmium, fluorine, have been introduced by accident or with the intent to improve the appearance or the keeping quality.
c. Infections due to the consumption of food containing bacteria of the Salmonella group.
d. Poisoning due to the deleterious substances (toxins) produced in food by the growth of bacteria, molds, or similar organisms.

Public Health Nursing Responsibility

If the nurse is the first person to visit the home, she should secure samples of probable causative food for laboratory examination.

Urge stool samples be sent to laboratory.

Advise prompt medical care.

Notify the health officer.

GERMAN MEASLES

(Rubella)

Recognition of the disease

A febrile infection occurring frequently in epidemics, characterized by papular-erythematous rash, sometimes resembling that of measles, sometimes that of scarlet fever, and sometimes of both at the same time; few or no constitutional symptoms but almost always enlargement of postauricular, suboccipital and cervical, and occasionally of other, lymph nodes. Usually an absence of leucocytosis.

Etiologic agent

A filterable virus.

Source of infection

Secretions of the mouth and possibly the nose.

Mode of transmission

By direct contact with the patient or with articles freshly soiled with the discharges from the nose or throat of the patient.

Incubation period

From 14 to 21 days; usually about 16 days.

Period of communicability

From onset of catarrhal symptoms for at least four days, but not more than seven; the exact period is undetermined. Highly communicable.

Susceptibility and immunity

Susceptibility is general among young children. An attack usually confers permanent immunity.

Prevalence

Epidemic in expression, occurring mostly in childhood, but more in adults than is the case with measles; more prevalent in winter and spring than at other seasons.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease by clinical symptoms.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Of no importance except to clarify doubts created by clinical difficulty in distinguishing this disease from scarlet fever in its early stages.

General Measures

Gamma globulin may protect or modify the disease in women who are susceptible and pregnant.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2575. The patient shall be isolated until clinically recovered. When the patient is properly isolated, members of the family or household are not subject to restriction.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

a. Early recognition of symptoms, followed by isolation of the patient.
b. Avoidance of exposure of females during pregnancy, especially during the first trimester, because of the resultant high incidence of congenital defects in the offspring.

GLANDERS

Recognition of the disease

Chiefly a disease of bones. Occurs in two forms, one external affecting the skin and known as "farcy," and an internal form known as "glanders." It may appear as an acute or chronic disease, with widely variable symptoms, the diagnosis being established by one or other of the following biologic reactions: The complement fixation test, the mallein skin test, the agglutination test, or by nonspecific reactions such as the Straus reaction, if confirmed by culture and identification of the *Malleomyces mallei*, or by autopsy where diagnosis has been uncertain at time of death.

Etiologic agent

Glanders bacillus. *Malleomyces mallei (Bacillus mallei).*

Source of infection

Discharges from open lesions of mucous membranes, or of the skin of infected horse or man (e.g., pus and mucus from the nose or throat, or bowel discharges).

Mode of transmission

Contact with infected horse or man or with articles freshly soiled by discharges therefrom.

Incubation period

Undetermined; usually one to five days.

Period of communicability

Until bacilli disappear from discharges or until lesions have healed.

Susceptibility and immunity

Susceptibility appears to be common. Immunity is believed to follow recovery from the infection.

Prevalence

Rare and sporadic and almost exclusively in men occupied about horses. In widespread and local epizootics in horses.

The infected individual, contacts, and environment

Methods of control

Recognition of the disease and reporting: In this disease, as in all infections or communicable diseases from which both animals and humans suffer, cases occurring in animals should be reported to the Department of Agriculture or livestock sanitary authority, and human cases should be reported to the department of health, reciprocal notification thereafter to be accomplished through official interdepartmental channels.

Infected horses should be destroyed rather than isolated. Skin contact with the lesions in the living or dead body is to be scrupulously avoided.

Concurrent disinfection: Discharges from patients or infected horses and articles soiled therewith.

Terminal disinfection: Stables and contents where infected horses are found.

Quarantine: Of all horses in an infected stable until all have been tested by specific reaction, and the removal of infected horses and terminal disinfection of stable have been accomplished.

Immunization: None of established value or generally accepted.

Investigation of source of infection: Carriers not known in humans. Search for infected horses especially in sales stables, by observation and specific laboratory tests.

General Measures

Treatment of human cases with sulfadiazine in large doses may be effective.

The abolition of the common drinking trough for horses.

Sanitary supervision of stables and blacksmith shops.

Semiannual testing of all horses by a specific reaction where the disease is common.

Testing of all horses offered for sale where the disease is common.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available Bacteriologic examination of pus or aspirated fluid from discharging lesions and animal inoculation for confirmation in the identification of the organism.

Serologic tests of blood serum from infected animals.

Collection of specimens Consult Division of Laboratories and request special mailing outfits for specimens.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2576. The patient shall be isolated until the lesions have healed. When the patient is properly isolated, members of the family or household need not be subject to restrictions.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

a. Planning for a long time of illness.
b. Quiet, cheerful environment for the patient.
c. Importance of asepsis and use of rubber gloves by attendant when changing dressings of the patient.

Teach procedures for: Disposal of nose and throat discharges, disposal of dressings, care of dishes, care of linen.

GONORRHEA

Recognition of the disease

A purulent infection of one of the mucous membranes, most frequently of the genital tract. Chronic and relapsing inflammatory conditions with discharge are common at the site of the original attack. The disease may spread to adjacent or remote tissues causing acute or chronic processes, among which are arthritis and endocarditis. Demonstration of the causative organism in lesions or discharges, preferably by culture, is the most certain diagnostic procedure.

Etiologic agent

Gonococcus, *Neisseria gonorrhoeae.*

Source of infection

Discharges from lesions of inflamed mucous membranes and glands of infected persons.

Mode of transmission

By direct personal contact with infected persons, and rarely by indirect contact with articles freshly soiled with the discharges of such persons. In adults by sexual intercourse; in children by personal and indirect contact with discharges; ophthalmic infection in the newborn by passage through the birth canal.

Incubation period

Two to 14 days, rarely longer, usually three to seven days.

Period of communicability

As long as the gonococcus persists in any of the discharges, whether the infection be acute or chronic. Readily communicated in sexual intercourse.

Susceptibility and immunity

Susceptibility appears to be general. Acquired immunity has not been shown to occur, but spontaneous recovery may occur. One attack does not protect against subsequent infection.

Prevalence

Widespread. Occurs among both sexes and at all ages, but is most prvealent among persons in the age groups of greatest sexual activity.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms, confirmed by bacteriologic examination.

Concurrent disinfection: Discharges from lesions and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of sources and contacts of infection: Search for and examination of sex contacts prior and subsequent to date of onset of acute cases.

See methods of Control under "Syphilis."

General Measures

Provision of adequate diagnostic facilities, including laboratory facilities, for identification of the gonococcus by microscopic examination and by culture methods.

Provision of facilities for the prompt and adequate treatment of infected persons with an appropriate chemotherapeutic agent or other recommended drug under medical supervision.

Public education as to the nature of gonorrhea and other venereal diseases, their clinical characteristics, prevalence,

mode of transmission, and particularly as to how to avoid infection, and to secure prompt examination and treatment if indicated.

Repression of commercialized prostitution and of clandestine sex promiscuity, and of associated excessive use of alcoholic beverages, with the cooperation of appropriate social and law enforcement agencies.

Restriction of advertising of services or medicines for self-treatment, and of the prescribing of treatment by other persons than physicians.

Use of prophylactic silver solution in the eyes of the newborn.

See Methods of Control under "Syphilis" and General Methods.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of smears.

Collection of specimens

Use special gonococcus containers provided by the Division of Laboratories. Detailed instructions for making smears are given on the reverse side of the accompanying report slip.

Smears should be made reasonably thin, spread evenly and allowed to dry at room temperature. Wet smears should never be placed together. (Failure to observe this precaution makes a reliable examination impossible.)

Interpretation of results

Positive report: Only when gram negative intracellular organisms typical of gonococci have been demonstrated.

Negative report: No organisms resembling gonococci and no appreciable number of pus cells present.

Inconclusive report: This report may be given whenever typical organisms resembling gonococci are present extracellularly or when marked numbers of pus cells are present which may indicate the presence of an infection or irritation.

Due to the difficulty of transportation of specimens to the laboratory, the Division of Laboratories does not at present offer any service for the culture of *Neisseria gonorrhoeae*. It is recommended that, whenever indicated, the services of local public health or private laboratories which are equipped to do this type of work be employed.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

See section on Venereal Diseases.

Public Health Nursing Responsibility

Teach content included in above sections.
Assist in case finding by:

a. Encouraging medical examination for anyone presenting symptoms, including infants and older children with discharging eyes.

b. Careful interviewing of known cases for contact information when so ordered by physician and when nurse is assigned to clinic service.
c. Follow-up of sex contacts of known infectious cases when it is the agency's policy to have public health nurses do this.

Assist in case holding by:

a. Individual patient education through interview.
b. Follow-up of cases until discharged as cured.

Teach importance of:

a. Avoiding alcoholic beverages.
b. Avoiding sexual stimulation including petting, kissing, etc.
c. Adequate rest.
d. Post-treatment examinations including serology tests for syphilis.

Teach procedures for disposal of dressings and care of linen.

GRANULOMA INGUINALE

Recognition of the disease

An acute or chronic infection of the skin and mucous membranes of the external genital organs and inguinal areas. Can be a generalized septicemic infection. The primary lesion is a small nodule, bleb, or papule resulting in a granulomatous-vascular lesion which bleeds easily on manipulation, and is frequently seen with daughter lesions in the same area. The lesion extends peripherally with the formation of masses of fibrous tissue, often exuberant and mixed with or bordered by active granulomatous lesions. The disease shows a predilection for warm and moist surfaces such as folds between the scrotum and thighs in the male, and the labia and vagina in the female; if neglected for several years may cause serious destruction of genital organs and spread to other parts of the body. Clinical diagnosis is confirmed by the microscopic examination of scrapings from ulcers for the causative organism.

Etiologic agent

Donovan body.

Source of infection

Discharges from lesions. Pediculosis pubis may be a factor in the spread of the disease.

Mode of transmission

Direct contact by skin and mucous membranes during sexual intercourse with infected persons. See above regarding Pediculosis pubis.

Incubation period

Variable; from a few days to three months after exposure.

Period of communicability

As long as there are open lesions on the skin or mucous membranes.

Susceptibility and immunity

Susceptibility appears to be general. Apparently no immunity is conferred by an attack.

Prevalence

Widely prevalent in tropical and subtropical areas; endemic and recognized with increasing frequency in the United States. Ninety percent of cases are Negroes.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of disease: Clinical symptoms, with confirmation by examination for the Donovan bodies.

Treatment with streptomycin or antimony compounds is recommended.

Isolation: Exclusion of infected persons from sexual contact.

Concurrent disinfection: Discharges from the lesions and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Search for and examination of sexual contacts of cases with primary lesions. Among married persons, examination of the marital partner regardless of the stage of the disease in the original case.

General Measures

Provision of adequate diagnostic facilities including laboratory examinations for the Donovan body, and provision of facilities for prompt treatment by appropriate chemotherapy under medical supervision.

Public education as to the nature of granuloma inguinale and other venereal diseases, their clinical characteristics, prevalence, mode of transmission, and particularly as to how infection may be avoided and prompt examination and treatment be secured.

Repression of commercialized prostitution and of clandestine sex promiscuity, and of associated excessive use of alcoholic beverages, with the cooperation of appropriate social and law enforcement agencies.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of scrapings from ulcerations for "Donovan bodies."

Collection of specimens

Smear scrapings from ulcers on microscopic slides as for microscopic examination for gonorrhea. Mark plainly "suspected granuloma inguinale" and mail in the regular container for gonorrhea.

Interpretation of results

Positive report: Organisms seen on the microscopic slides which are morphologically similar to the "Donovan bodies." This should be considered only as confirmation of clinical findings.

Negative report: No organisms seen which resemble "Donovan bodies." A negative report should not be considered as sufficient evidence to exclude the disease.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Section 2578. See section on Venereal Diseases.

Public Health Nursing Responsibility

Teach content included in above sections.

Assist in case finding by:

a. Encouraging medical examination for anyone presenting symptoms.
b. Careful interviewing of known cases for contact information when so ordered by physician.
c. Follow-up of sex contacts of known infectious cases when it is the agency's policy to have public health nurses do this.

Assist in case holding by:

a. Individual patient education through interview.
b. Follow-up of cases until discharged as cured.

Teach importance of:

a. Sleeping alone if possible.
b. Abstaining from sexual intercourse until cured.
c. Using individual personal articles.
d. Regular treatment.
e. Reporting tartar emetic treatment reactions to physician (anorexia, sore gums, nausea and vomiting, joint pains).

Teach procedures for care of linen, disposal of dressings.

HEMORRHAGIC JAUNDICE

(Icterohemorrhagic Spirochetosis, Weil's Disease)

Recognition of the disease

An acute infection characterized by malaise, prostration, gastrointestinal symptoms, muscular pains, and fever at the onset, followed by defervescence, jaundice, and signs of nitrogen retention, of varying degree and duration. Relapses may occur. Severe cases develop hemorrhages at various sites and renal damage may be marked. About 50 percent of cases are without jaundice. Isolation of *Leptospira icterohaemorrhagica* or *L. canicola* by inoculation of guinea pigs with the blood early in the course of the disease, or with the urine later, definitely identifies the condition. Positive serologic tests strongly indicate the presence of this disease.

Etiologic agent

Leptospira icterohaemorrhagica, found in the blood or urine of patients and in the renal tract of rats. *L. canicola,* primarily a spirochete of dogs, is found in some human cases.

Source of infection

Urine and feces of rats, dogs, foxes, sheep, cats, and mice are at times involved. Wild rats often harbor leptospira in their kidneys. They are persistent carriers.

Mode of transmission

It appears that ingestion of contaminated food and water plays a role and that continued exposure of abraded or unabraded skin to alkaline waters containing leptospira may lead to infection. Sewer workers, fish workers, miners, and veterinarians are especially exposed to infection.

Incubation period

Four to 19 days, average 9 to 10 days.

Period of communicability

The urine of patients continues to contain organisms for weeks or months following convalescence. Only one human case has been traced to direct contact.

Susceptibility and immunity

Susceptibility is general. A refractory state develops following recovery, and immune bodies may be detected for a considerable period thereafter.

Prevalence

The disease is present in rats over the entire world. Sporadic human cases have been reported widely in the United States.

Method of control

The infected individual, contacts, and environment

Recognition of the disease and reporting: Characteristic clinical symptoms, isolation of the organism from the blood or urine, and positive serologic tests.

Isolation: None.

Concurrent disinfection: Urine and other discharges of patient.

Terminal disinfection: None.

Quarantine: None.

Immunization: None practical.

Investigation of source of infection: Search for rats or dogs harboring leptospira and for source of food or water to which such animals have access, e.g., communal baths, fish-cleaning establishments, mines, sewers, etc.

General Measures

Rat control by ratproofing, and poisoning.

Sanitary disposal of human wastes in civil and military environment.

Destruction of leptospira in nature by draining of mines and soil, and disinfection of water in fish-cleaning establishments with 1:60 hypochlorite solution.

Education in the value of proper disposal of garbage, storing and keeping foods, and other general sanitary measures.

Protection of workers exposed to infection by preventing organisms from entering through the skin and mouth, by the use of boots and gloves, the avoidance of skin abrasions, etc.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination tests on blood specimens.

Collection of specimens

Ten to 14 days after onset and again after 21 days, collect 5 cc. venous blood aseptically and place in sterile vial. Standard Wassermann or typhoid Widal mailing outfit may be used. Mark accompanying report slip plainly "For Leptospira Agglutination."

Interpretation of results

Positive report: Agglutination in dilution 1-100 or over.

Negative report: No agglutination, or titer below 1-100.

Since human infections may be caused by either *L. icterohemorrhagica* of rat origin or *L. canicola* of dog origin, antigens of both species are used in the diagnostic test. In case of a postive reaction, the specific type will be stated.

The test should be applied to acute and convalescent serum to confirm an increase in titer, without which a definite diagnosis cannot be established.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Section 2579. Reportable only. No restrictions on case or contacts.

Public Health Nursing Responsibility

Teach contents included in above sections and stress: Home sanitary measures regarding storage of raw food, washing raw vegetables prepared for the table, garbage disposal.

Teach procedure for disposal of excreta.

HEPATITIS, INFECTIOUS

(Acute Catarrhal Jaundice)

Recognition of the disease

An acute infection characterized by a prodromal period of from less than a day to about a week; following which jaundice of more or less severity occurs. The prodromal symptoms include headache, abdominal pain, malaise, anorexia, nausea, and vomiting. Fever is usually present although it may be so slight as to be missed. Toward the end of this period bile may be detected in the urine, and jaundice of minimal to marked intensity is soon noted, persisting for days or weeks. A leucopenia with relative lymphocytosis may be present. Convalescence is of variable length.

There is considerable variation in the degree of severity of the disease, ranging from anicteric cases to cases of acute yellow atrophy of the liver.

Etiologic agent

A specific filterable virus.

Source of infection

Discharges from the alimentary tract of infected persons and possibly also from the nose and mouth. The blood may contain the infectious agent. There may be carriers.

Mode of transmission

Unknown; water, direct contact through droplet nuclei are possible routes.

Incubation period

Appears to be 21 to 35 days.

Period of communicability

Unknown.

Susceptibility and immunity

Most common among children and young adult males. Cases have been observed among individuals of all age groups. The disease is, in most instances, of longer duration and greater severity among adults than among children. Second attacks have not been reported.

Prevalence

Epidemics are most commonly reported from rural areas and from institutions. Most outbreaks begin during the fall and winter months.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: By clinical symptoms.

Concurrent disinfection: Discharge of nose, throat, and bowels of the patient.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Desirable to detect and isolate other cases. Must distinguish from cases of Homologous Serum Jaundice.

Contacts: Some evidence that gamma globulin will protect if administered at the proper time.

General Measures

Physicians of the vicinity should be informed when this disease is prevalent.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2580. The patient shall be isolated in accordance with Section 2518 during the acute symptoms. No restrictions need be exercised over contacts.

Public Health Nursing Responsibility

Teach content included in above sections, as well as procedures for disposal of nose and throat discharges and disposal of excreta.

HOOKWORM DISEASE

(Ancylostomiasis)

Recognition of the disease

The symptomatology varies greatly in accordance with the degree of infection and other factors. Dermatitis or so-called "ground-itch" is apt to be the first symptom of infection appearing commonly on the feet or other parts of the body coming in contact with contaminated soil. The presence of only a few worms may give rise to no symptoms. Moderate to severe infections may be characterized by abdominal pain, indigestion, flatulence, abnormal or depraved appetite, and distended abdomen. Some cases show severe diarrhea; others may have alternate constipation and diarrhea. The skin is sallow, dry, and harsh. The patient is depressed and listless, and the features expressionless. Children may show marked physical and mental retardation. Severe secondary anemia may be present and there is usually an eosinophilia. In severe cases, there is frequently edema in various parts of the body, particularly in the dependent portions. Systemic symptoms are usually more pronounced in patients on an inadequate or unbalanced diet and those suffering concomitantly from malaria and other debilitating conditions. Diagnosis is established by finding hookworm ova in the stools.

Etiologic agent

Necator americanus and *Ancylostoma duodenale.*

Source of infection

Usually soil contaminated with infective larvae from ova in stools deposited by infected persons. Larvae usually penetrate through the skin, although infection can take place by mouth.

Mode of transmission

The infective or third-stage larvae penetrate the skin, usually of the foot, and pass via the lymphatics to the inferior vena cava and the right heart, thence in the blood stream to the lungs, where they pierce the capillary walls and pass into the alveoli. They then pass up the bronchi and trachea to the throat, whence they are swallowed and finally reach the small intestine, where they develop to maturity. Infection can take place by mouth from water, soil, or contaminated objects harboring infective larvae; however, the chief mode of infection is through the skin.

Incubation period

No incubation period occurs comparable to that observed in bacterial and virus infections. Onset of symptoms varies widely in time, according to the intensity of the infection, from two to three weeks in massive infections (commonly 7 to 10 weeks), to many months or even years where infection or reinfection is by small numbers of worms. The free living form may exist in the soil under favorable conditions for several weeks. Eggs are found in the stools about four to six weeks after larvae penetrate the skin, and develop the next generation of larvae five to eight days after being deposited on soil, under favorable conditions.

Period of communicability

Infected individuals remain potential spreaders of infection as long as they remain infected and continue to pollute soil. Third-stage larvae may remain alive in soil for several weeks under favorable conditions.

Susceptibility to infection is universal. In general, adults are less frequently infected than children, and Negroes less frequently than whites. Some degree of immunity is developed by a person who has had an infection. Susceptibility and immunity

Widely endemic in areas having favorable soil, moisture and temperature for development, and where winter temperatures are not sufficiently low to destroy larvae in soil. Prevalence

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: Finding ova or worms in the stools.

Isolation: None.

Concurrent disinfection: Sanitary disposal of bowel discharges to prevent contamination of soil and water.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Each case and carrier is a potential or actual spreader of the disease. All family contacts should be examined.

Treatment: For the removal of worms from the intestinal tract appropriate treatment of clinical cases with tetrachlorethylene, hexylresorcinol, or carbon tetrachloride, with preference in the order named.

General Measures

Education as to dangers of soil pollution and methods of prevention.

Prevention of soil pollution by installation of sanitary disposal systems for human discharges, especially sanitary privies in rural areas, and education of the public in the use of such facilities.

Personal prophylaxis by cleanliness and the wearing of shoes.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Microscopic examination of feces for ova (or larvae) of *Necator Americanus* and *Ancylostoma Duodenale*. Services available

Place portions of feces from various parts of the stool in the bottle provided in standard mailing outfit for amoebic dysentery. Mark accompanying report slip plainly for "Hookworm." Collection of specimens

Positive report: Ova or larvae identified as those of hookworm. Interpretation of results

Negative report: No ova or larvae demonstrated in specimen submitted.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

IMPETIGO CONTAGIOSA

Recognition of the disease

A purulent dermatitis, occurring sporadically and in small epidemics, and characterized initially by vesicular lesions which later become crusted, seropurulent plaques. Commonly found on the face and hands, but sometimes widely scattered over the body.

Etiologic agent

Probably staphylococci or streptococci.

Source of infection

Lesions on the skin of an infected person; possibly discharges from the nose and throat.

Mode of transmission

Directly by contact with the moist discharges of the skin lesions, or indirectly by contact with articles recently soiled by those discharges. The infection may be readily inoculated from place to place on the patient's body by scratching.

Incubation period

Undetermined, but usually within five days and often within two.

Period of communicability

While lesions remained unhealed.

Susceptibility and immunity

Susceptibility general, especially among children and debilitated persons.

Prevalence

Common among children, especially in warm weather. Occurs sporadically and also in epidemic outbreaks in children's institutions and summer camps. Likely to spread rapidly where measures of personal hygiene are neglected and where skin lesions are frequent following scratching.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: By appearance of the characteristic clinical picture. Reporting of epidemic prevalence by institutions may be important to prevent spread in schools, hospitals, and among groups of children.

Isolation: Protection from contact with other children or debilitated persons until pustules are healed.

Concurrent disinfection: Careful disposal of dressings and moist discharges from the patient, and sterilization of underclothes and towels before laundering; care should be taken to avoid reinfection from contaminated washcloths, combs, etc.

Terminal disinfection: Thorough cleaning of towels, hair brushes and combs, etc.

Quarantine: None.

Immunization: None.

Investigation of source of infection: On the appearance of a case in a group of children, the others should be watched. Among infants it is especially important to locate any skin infection in an attendant. All persons with skin lesions should be kept from even indirect contact with newborn babies.

General Measures

Personal cleanliness, particularly the avoidance of common use of toilet articles among children.

Prompt treatment with mercury or penicillin ointments of the first case in a group of children will abbreviate the period

of communicability and prevent extension of lesions to new sites as well as to other children.

Eradication of parasitic infestations of the skin.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

INFLUENZA

Recognition of the disease

Whether occurring in a pandemic, in endemic-epidemic incidence, or as sporadic cases, this disease is characterized in its typical form by sudden onset, fever of one to seven days' duration, accompanied by prostration, marked aches and pains in the back and limbs, coryza, injected conjunctiva, and by bronchitis, and pneumonia as a complication.

Microscopic or other laboratory procedures for the diagnosis of influenza are still in the experimental stage, but have clinical value if appropriate laboratory service is available.

Etiologic agent

Two distinct types of virus with various antigenic strains, designated as type A and type B, have been identified. The more widespread recent epidemics have been associated with influenza A. Influenza B has usually been found in smaller and more localized outbreaks.

Source of infection

Probably discharges from the mouth and nose of infected persons and articles freshly soiled by such discharges.

Mode of transmission

Believed to be by direct contact, by droplet infection, or by articles freshly soiled with discharges of the nose and throat of infected persons.

Incubation period

Short, usually 24 to 72 hours.

Period of communicability

Undetermined; possibly in the prodromal as well as in the febrile stage.

Susceptibility and immunity

Susceptibility is general, although natural resistance or relative immunity appears to protect from one-quarter to three-quarters of persons intimately exposed to the disease even during widespread epidemics. Acquired immunity resulting from an attack and recovery from the disease is of short duration (a few months to a year) and is effective only against specific strains of the virus. Artificial immunization with specific strains of influenza virus is still uncertain and is not recommended for mass inoculations.

Prevalence

Variable, in pandemics, local epidemics, and as sporadic cases, often unrecognized by reason of indefinite clinical symptoms. In epidemics, may affect up to 20 percent of the population. Occurs pandemically at irregular intervals.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: By clinical symptoms only. Uncertain in interepidemic periods.

Concurrent disinfection: Discharges from the nose and throat of the patient.

Terminal disinfection: None.

Investigation of source of infection: Of no practical value.

Laboratory recognition of secondary invading bacterial pathogens is important from the standpoint of chemotherapy.

General Measures

During epidemics efforts should be made to reduce opportunities for direct contact infection, as in crowded halls, stores,

and street cars. Kissing, the use of common towels, glasses, eating utensils, or toilet articles should be avoided. In isolated population groups and institutions infection has been delayed and sometimes avoided by strict exclusion of all visitors. The closing of the public, parochial, and private schools has not been effective in checking the spread of infection. To minimize the severity of the disease, and to protect the patient from secondary infections and thus reduce mortality, patients should go to bed at the beginning of an attack and not return to work without the approval of their physician. Appropriate chemotherapy should be instituted at once if evidence of secondary pneumonia appears.

Large aggregations of young adults unaccustomed to such association create a danger of spread of influenza when it is prevalent, especially when the individuals are subject to chilling, much fatigue, or deprivation of customary bodily comforts, and such aggregations are to be avoided as much as possible.

Crowding of beds in hospitals and institutions to accommodate increased numbers of patients and other inmates is to be especially avoided. Increased spacing between beds in wards and dormitories should be carried out to reduce the risk of attack, and of the occurrence of pneumonia.

Immunization

Who should be immunized

Immunization is experimental only. *General immunization of the population by health departments is not recommended at this time.* Before expected outbreaks of epidemic influenza types A and B, physicians, nurses, and other professional personnel may be vaccinated.

Administration

Immunizing Agent: Influenza virus vaccine for prophylaxis against types A and B influenza is available from a number of biologic firms. It is obtained from the virus propagated in the allantoic fluid of embryonated eggs.

When administered within a few months before an outbreak of type A and B epidemic influenza, the vaccine seems to have favorably influenced the attack rate of vaccinated persons as compared with unvaccinated controls in some experiments. Some antibody is apparent within 10 days following administration of the immunizing agent, and the greatest protection is probably derived during the few weeks immediately following vaccination. Differences in antigenic strains may result in a failure to gain protection.

Dosage: Follow instructions of the manufacturer. The usual prophylactic adult dose is one injection of 1.0 cc. administered subcutaneously or 0.1 cc. intradermally on the upper arm. Before the vaccine is withdrawn into the syringe, the container should be thoroughly shaken to assure an even suspension.

Reinforcing Injections: Revaccination may be advisable if an epidemic occurs more than three months following the initial inoculation.

Reactions

Local and systemic reactions may occur. Caution should be exercised in administering influenza virus vaccine to persons with a history of allergy. Children are more sensitive and should receive only 0.5 cc. subcutaneously or 0.1 cc. intradermally.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Chicken cell agglutination-inhibition test for types A and B.

Isolation of virus.

Collection of specimens

Blood for chicken cell agglutination: Two specimens of serum are necessary. The first should be taken as soon as possible after the onset, and the second 14 days after the first. Collect approximately 20 cc. venous blood aseptically and send in a sterile vial. Containers will be supplied on request to the Division of Laboratories. Tests will not be run on single specimens as they are of no diagnostic significance unless a rise in titer can be demonstrated.

Specimens for virus isolation:

a. Sputum, nose, and throat washings. Send iced or frozen in dry ice in rubber stoppered tube. Specimens must not thaw before reaching the laboratory. If possible, nose and throat washings should be taken in plain broth.
b. Lung tissue in rubber stoppered tubes or jar with air-tight rubber gasket. Ship packed in dry ice. *(Important to pack specimen in dry ice immediately after collection. Must not thaw before reaching the laboratory.)*

For all specimens, complete accompanying report slip, being sure to give *date of onset, disease suspected, date of specimen,* and, for blood, whether first or second specimen. These data are essential to performance and interpretation of the tests.

Interpretation of results

Chicken cell agglutination-inhibition test: Positive report: A fourfold rise or more in titer between acute and convalescent specimens is considered positive for type A or B virus.

Negative report: No agglutination-inhibition obtained or no rise in titer is demonstrable between acute and convalescent specimen.

Virus isolation: Positive report: Specific virus isolated and identified.

Negative report: No isolation or detection of virus by laboratory methods used.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

Section 2582. The patient shall be isolated in accordance with Section 2518 during the acute symptoms. When the patient is properly isolated, no restrictions need be placed upon the contacts.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach importance of:

a. Excluding visitors from patients.
b. Preventing patient's exposure to other diseases.
c. Preventing chilling of the patient.
d. Gradual return of patient to normal activity.

Teach procedures for disposal of nose and throat discharges.

KERATOCONJUNCTIVITIS, INFECTIOUS

(Superficial Punctate Keratitis, Nummular Keratitis)

Recognition of the disease Acute onset usually with sensation as of foreign body under the upper lid. Edema of lid, scleral injection, follicular hypertrophy of palpebral conjunctiva, enlargement and tenderness of preauricular lymph node with a watery discharge, followed in few or many of the cases by multiple pinpoint corneal opacities. Involvement usually unilateral.

Etiologic agent Considered to be a specific filterable virus.

Source of infection Probably the discharge from the eye of an infected person or a carrier.

Mode of transmission Apparently contact with an infected person or carrier or with articles freshly soiled with discharges of such person.

Incubation period Not definitely established but probably about five days.

Period of communicability Unknown but certainly during acute stage of the disease.

Susceptibility and immunity Susceptibility variable. No age, sex, or race known to be immune.

Prevalence Occurs in epidemic form in warm climates, also among industrial employees in temperate climates involving a small percentage of the individuals in the groups affected.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical course confirmed by smears of conjunctival scrapings showing mononuclear cells and none of the usual etiologic agents of other forms of conjunctivitis.

Isolation: None, provided hygienic measures are taken by the infected person.

Concurrent disinfection: Disinfection or destruction of conjunctival and nasal discharges and articles soiled therewith.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: To locate other cases and institute precautions at home or working place.

General Measures

Education as to personal cleanliness and as to danger of use of common towels and toilet articles.

Avoidance of contact of hands with conjunctival or nasal discharges.

Aseptic technique in all professional care of patients with eye diseases and injuries.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available No regular laboratory services available. Consult the Division of Laboratories for instructions regarding the submission of specimens.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

LEISHMANIASIS (AMERICAN), MUCOCUTANEOUS LEISHMANIASIS, ESPUNDIA, UTA, BUBAS

Recognition of the disease

Indolent ulcerating cutaneous lesions of the face, hands, feet, and other exposed parts of the body. In 10 to 20 percent of the cases mucous membranes are involved resulting in extensive necrosis of the nose, mouth, and pharynx. Diagnosis is confirmed by microscopic identification of the etiologic agent in scrapings from surface lesions.

Etiologic agent

Leishmania braziliensis.

Source of infection

The *Leishmania* in cutaneous and mucocutaneous lesions.

Mode of transmission

Presumably through the bite of infected sand flies of the genus *Phlebotomus;* also, by direct contact with infected individuals.

Incubation period

Varies from a few weeks to many months.

Period of communicability

As long as open lesions are present.

Susceptibility and immunity

Both sexes and all ages apparently equally susceptible. An attack confers immunity.

Prevalence

Reported from every country in South America except Chile. Reported from Central America and Mexico but not in the United States.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical signs and symptoms may be confirmed by the demonstration of *Leishmania* in scrapings from the lesion.

Isolation: The infected individual should be protected from the bites of *Phlebotomus*. Close contact with infected persons should be avoided.

Concurrent disinfection: None. Destruction of sand flies in the dwelling.

Terminal disinfection: None. Destruction of sand flies in the dwelling.

Quarantine: None.

Immunization: None.

Investigation of source of infection: The finding of *Phlebotomus* breeding places especially in masonry cracks, under stones, and in rubble heaps.

General Measures

Screening sleeping and living quarters by use of insect nets with 25-30 meshes per inch, which should be sprayed with an insecticide before entering. Window screens should be sprayed nightly.

Killing sand flies in living quarters.

Elimination of breeding places of *Phlebotomus* sand flies in proximity to dwellings.

Avoidance of known infected areas.

Provision for diagnosis and treatment with specific chemotherapy should be provided.

The use of an insect repellent carefully applied each evening to the exposed parts of the body.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of stained smears of skin scrapings or aspirated serum.

Serologic examination of blood serum.

Collection of specimens

Smear scrapings or exudates from lesions on clean glass slides. Special mailing outfits will be supplied upon request to the Division of Laboratories or standard outfits for either gonococcus or malaria examination may be used. Mark report slip plainly "For Leishmania." Whole blood for serologic test may be submitted in the regular Wassermann mail outfit. Report slip should be plainly marked "For Leishmania."

Interpretation of results

Positive report: Organisms demonstrated which resemble *L. braziliensis.*

Negative report: No parasites demonstrated.

Other Leishmanian diseases

1. Kala-azar or visceral leishmaniasis.

Etiologic agent—*L. donovani* found in the tissues of man only in the leishmanian form, in intracellular non-flagellated, oval bodies. They may be present in small numbers in the blood but are found in nearly all the internal organs especially in the reticulo-endothelial cells.

Laboratory diagnosis

Microscopic examination: Blood smears, concentrate of caked blood, aspirated material from spleen, liver or bone marrow. Consult Division of Laboratories and request special mailing outfits.

2. Oriental sore, or cutaneous leishmaniasis. Etiologic agent, *L. tropica.* The parasite invades the reticulo-endothelial cells of the skin rather than those of the viscera in man.

Laboratory diagnosis

Microscopic examination of material obtained from cutaneous lesions rather than from blood or viscera. Skin lesion may be scraped or serum aspirated. See under American leishmaniasis *(L. braziliensis).*

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

LEPROSY

Recognition of the disease

The disease is to be identified by lesions of the skin and mucous membranes and by neurologic manifestations. Confirmation by microscopic examination is usually possible in cutaneous and mixed types of the disease but may be difficult or impossible in maculo-anesthetic and neural cases.

Etiologic agent

Leprosy bacillus, *Mycobacterium leprae,* (Hansen's bacillus).

Source of infection

Discharges from lesions.

Mode of transmission

Intimate and prolonged contact with infected individuals and some other as yet undetermined factor are apparently necessary.

Incubation period

Prolonged, undetermined, from one to several years.

Period of communicability

Commences when lesion becomes open, i.e., discharges leprosy bacilli; continues until healing. Patients with demonstrable acid-fast bacilli in smears from skin or mucous membranes are potentially "open" cases even if demonstrable ulceration be not present. Communicable only in certain geographic areas; in continental United States notably in states bordering on the Gulf of Mexico.

Susceptibility and immunity

Susceptibility uncertain; no racial immunity.

Prevalence

Endemic in some Gulf coast areas of the United States, Hawaii, Philippines, and Puerto Rico. Prevalence practically confined to tropical and sub-tropical areas. Usually more frequent among adolescent and young adult males.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms confirmed by microscopic examination where possible.

Concurrent disinfection: Discharges and articles soiled with discharges.

Terminal disinfection: Thorough cleaning of living premises of patient.

Immunization: None.

Investigation of source of infection: This should be undertaken especially in cases of apparently recent origin. The long and uncertain period of incubation and the length of intimate contact believed to be necessary make the discovery of the source of infection a matter of great difficulty.

General Measures

In endemic areas leprosy is usually contracted in childhood but it may be acquired in adult life. Infants should be separated from leprous parents at birth, and in educational efforts stress should be placed upon the greater risk of exposure in early life.

Lack of information as to the determining factors in the spread and communication of the disease makes any but general advice in matters of personal hygiene of no value. Puberty and pregnancy usually are conducive to the appearance of lesions in contacts.

As a temporary expedient, patients may be properly cared for in general hospitals, or, if conditions of the patient and his environment warrant, he may be allowed to remain on his own premises under suitable regulations.

In the temperate zone of the United States where the disease shows no tendency to spread, suitable medical and nursing care of infected persons is sufficient.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of smears.

Collection of specimens

Smear scrapings or exudates from cutaneous lesions on slides. Special mailing outfits will be supplied upon request to the Division of Laboratories or the standard outfit for gonococcus examination may be used. Mark report slip plainly "For Leprosy."

Interpretation of results

Positive report: Acid-fast bacilli occurring in "lepra cells" or in bundles characteristic of *Mycobacterium leprae* have been observed.

Negative report: No acid-fast organisms typical of *Mycobacterium leprae* were observed.

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Case

SECTION 2584. Quarantine of the premises may at times be advisable. The patient shall be kept under strict isolation until determined by clinical observation, and by the absence of acid-fast bacilli on repeated examinations, to be apparently arrested. Contacts shall be kept under observation over a period of years to determine if they have become infected.

Public Health Nursing Responsibility

Teach content included in above sections.

Aid the patient and his family to make a satisfactory psychological adjustment to the disease.

Interpret long term care to be given in The National Leprosarium at Carville, Louisiana.

Interpret social and economic community resources to family when patient is the wage earner.

Teach procedures for terminal disinfection, disposal of dressings and care of linen when indicated.

LYMPHOGRANULOMA VENEREUM (INGUINALE) AND CLIMATIC BUBO

Recognition of the disease

Adenopathy, inguinal in male, pelvic in female, and history of exposure to venereal infection. Characterized by small herpetiform lesion at point of inoculation on external genitalia or uterine cervix (rarely in mouth), usually transitory, followed by massive subacute or chronic adenitis and periadenitis, usually with multiple foci of suppuration. Associated with constitutional symptoms, fever, prostration, loss of weight, arthritic affections, and skin reactions. Clinical diagnosis may be confirmed by Frei antigen intradermal test.

Etiologic agent

A specific filterable virus.

Source of infection

Discharges from lesions.

Mode of transmission

Direct contact by skin and mucous membranes, almost exclusively in sexual relations with infected persons, or indirectly by articles soiled with discharges from lesions of such persons.

Incubation period

One to four weeks until appearance of evanescent initial lesion. Glandular enlargement, usually the first recognized lesion, appears from 10 to 50 days after exposure.

Period of communicability

As long as there are open lesions upon skin or mucous membranes.

Susceptibility and immunity

Susceptibility appears to be general. Immunity apparently does not follow an attack of the disease. There is no artificial immunity.

Prevalence

A venereal infection more common among Negroes. Widely prevalent in the tropics.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical symptoms, with confirmation by the Frei test.

Isolation: Exclusion of infected person from sexual contacts during the prevalence of open lesions.

Concurrent disinfection: Discharges and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of sources and contacts of infection: Search for and examination of sexual contacts prior and subsequent to the date of first symptoms of known cases.

General Measures

Provision of adequate diagnostic facilities, including a reliable antigen for intradermal testing, and provision of facilities for prompt treatment with a sulfonamide drug under medical supervision.

Public education as to the nature of lymphogranuloma venereum and other venereal diseases, their clinical characteristics, prevalence, mode of transmission, and particularly as to how to avoid infection and to secure prompt examination and treatment if indicated.

Repression of commercialized prostitution and of clandestine sex promiscuity, and of associated excessive use of alcoholic beverages, with the cooperation of appropriate social and law enforcement agencies.

See Methods of Control, General Measures, under "Syphilis."

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Complement fixation tests on blood specimens.

Collection of specimen

Collect approximately 5 cc. venous blood aseptically and place in the standard vial used in mailing specimens. Containers will be supplied upon request to the Division of Laboratories.

Interpretation of results

In a 1-6 dilution of serum, O, plus-minus and plus are reported negative. In a 1-6 dilution of serum, two-plus is reported doubtful. In a 1-6 dilution of serum, three-plus or four-plus are reported weakly positive. In a 1-12 (or higher) dilution of serum, four-plus is reported positive.

Negative complement-fixation tests do not conclusively rule out the infection. Positive findings are known to occur in other diseases or in infections with certain related viruses (psittacosis, ornithosis). Nevertheless, the test is a distinct aid in the confirmation of clinical findings.

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Section 2585. See section on Venereal Diseases.

Public Health Nursing Responsibility

Teach content included in above sections.

Assist in case finding by:

a. Encouraging medical examination for anyone presenting symptoms.
b. Careful interviewing of known cases for contact information when so ordered by physician and when nurse is assigned to clinic service.
c. Follow-up of sex contacts to known infectious cases when it is the agency's policy to have public health nurses do this.

Assist in case holding by:

a. Individual patient education through interview.
b. Follow-up of cases until discharged as cured.

Teach importance of:

a. Avoiding sexual intercourse until cured.
b. Personal hygiene.
c. Reporting treatment reactions to physician when under sulfatherapy, (headache, dizziness, nausea, vomiting, jaundice, hematuria, cyanosis, fever).

Teach procedures for disposal of dressings and care of linen.

MALARIA

Recognition of the disease

A group of specific infectious fevers due to invasion of the red blood cells by one of four species of Sporozoa of the genus *Plasmodium*. These fevers occur endemically or epidemically and are associated with a symptom complex fairly characteristic of each variety, marked particularly by periodicity of fever and symptoms due to the growth and development of the organism. Enlargement of the spleen, secondary anemia, and the characteristic recurrence of chills and fever as clinical findings are confirmed by observing the presence of the malaria parasites in a blood film under microscopic examination. Female mosquitoes of the anopheline genus are the only known vectors.

Etiologic agent

The several species of micro-organisms: *Plasmodium vivax* (tertian), *Plasmodium malariae* (quartan), *Plasmodium falciparum* (aestivoautumnal or malignant subtertian), *Plasmodium ovale*.

Source of infection

The blood of an infected individual.

Mode of transmission

By bite of the infected anopheline mosquitoes. The mosquito is infected by biting an individual suffering from acute or chronic malaria. The parasite develops in the body of the mosquito for a variable period depending on the external temperature, under favorable conditions from 10 to 14 days (21 days for quartan), after which time the sporozoites appear in its salivary glands. The disease may be transmitted by blood transfusion or by injecting whole human blood; also by common use of unsterilized hypodermic syringe as by drug addicts).

Incubation period

Varies with type of species of infecting micro-organism, usually 10-14 days in the tertian variety.

Period of communicability

As long as the sexual form of the malaria micro-organism exists in the circulating blood in sufficient quantities to infect mosquitoes. In untreated cases this may last for months, and in treated cases the sexual as well as the asexual forms of the parasite may recur in the blood from time to time.

Susceptibility and immunity

Susceptibility is universal. Some relative homologous immunity appears to follow repeated attacks of the disease, presumably because the immunity finally covers all of the local strains of the species involved; these attacks confer no immunity to infection with another species of *Plasmodium*, and only slight immunity to a newly introduced strain of the same species. A state of good nutrition is considered to be a factor in maintaining resistance to the disease and in spontaneous recovery.

Prevalence

Widespread in tropical and subtropical areas.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms, always to be confirmed by microscopic examination of the blood. Repeated examination of blood films may be necessary; the thick-film method is particularly advisable where competent laboratory aid is available. Most patients under active treatment will fail to show circulating parasites by any method of examination.

The individual with malarial parasites in his blood should be protected from the bites of mosquitoes. With the exception of this simple precaution, isolation and quarantine are of no avail.

Concurrent disinfection: None. Destruction of anopheline mosquitoes in the dwelling.

Terminal disinfection: None. Destruction of anopheline mosquitoes in the dwelling.

Immunization: None.

Specific therapy: Quinacrine (atabrine, mepacrine) and quinine salts are the preferred drugs for routine treatment.

Investigation of source of infection: Breeding places and house infestation by anopheline mosquitoes should be sought for and larvae and mosquitoes destroyed when and where possible. Dissection of house-caught mosquitoes and microscopic examination of their salivary glands reveal which of the species found is the important vector. The breeding places of this particular species should be located and its reproduction prevented.

General Measures

Employment of known measures for destroying larvae of anophelines and the eradication of breeding places of such mosquitoes.

Blood examination of persons living in infected centers to determine the incidence of infection.

Screening sleeping and living quarters; use of mosquito nets.

Killing mosquitoes by sprays and other means in quarters where persons may be exposed to them.

Education of the public as to the mode of spread and methods of prevention of malaria.

Adequate curative treatment of persons with clinical attacks of malaria.

Liberal use of suitable repellents applied to the skin by persons unable otherwise to protect themselves against anopheline mosquitoes.

Routine oral administration of suppressive doses of quinacrine (atabrine, mepacrine) or of quinine salts for persons exposed to infection and unable to avoid mosquitoes may be advisable in military personnel.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of blood smears.

Collection of specimens

Collect the blood specimen on a clean dry slide as directed by the instructions accompanying the containers provided by the Division of Laboratories.

A thick film, in addition to the above, should be made at one end of the same slide by one of the following methods:

a. Touch the surface of slide about one-quarter inch from one end to the large, rotund drop of blood on the punctured skin and without losing contact with the drop or touching the skin of the finger move the slide in narrow circles until a smear of satisfactory thickness and size is made.

b. Place 3-5 average drops of blood close together on the slide about one-quarter inch from the end opposite the etched portion and immediately puddle these into one homogeneous drop of proper size using a needle or the corner of a clean slide.

Interpretation of results

Positive report: Forms observed which resemble the malaria parasite. The specific type is reported whenever possible.

Negative report: No parasites demonstrated.

Limitations of tests

Light infections may be missed, particularly with the thin film only. A few parasites may be found in the thick film only in such cases. Because of the fact that *Plasmodium falciparum* (aestivo-autumnal parasite) disappears from the peripheral blood soon after the chill, a series of examinations are more frequently necessary to detect this parasite than for detection of the other species.

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Section 2586. The patient shall be confined in a room or dwelling satisfactorily screened and be protected from the bites of mosquitoes during the stages in which the malarial parasites may be in the blood.

Public Health Nursing Responsibility

Teach content included in above sections.

Be alert for cases which may be overlooked.

MEASLES (RUBEOLA)

Recognition of the disease

Clinical characteristics are fever, catarrhal symptoms in eyes, nose, and throat in the prodromal stage, as well as at the height of the disease, an early eruption in the mouth, Koplik spots, later an exanthem and enanthem, and a branny desquamation during convalescence. When the disease is prevalent, or a susceptible child has been exposed to a case of measles, the diagnosis should be suspected on appearance of the fever and catarrhal symptoms, without waiting for confirmatory eruptions, and isolation precautions should be instituted at once.

Etiologic agent

A specific filterable virus.

Source of infection

Buccal and nasal secretions of an infected individual.

Mode of transmission

Directly from person to person; indirectly through articles freshly soiled with the buccal and nasal discharges of an infected individual. One of the most easily transmitted of the communicable diseases.

Incubation period

About 10 days from date of exposure to onset of fever; 13 to 15 days to appearance of rash; uncommonly longer or shorter. When artificial immunization has been attempted, but too late to prevent infection, the incubation period may be as long as 21 days.

Period of communicability

During the period of catarrhal symptoms; the usual period about nine days; from four days before to five days after the appearance of the rash.

Susceptibility and immunity

All persons must be considered susceptible until they have had the disease, except that most babies born of mothers who have had the disease are immune for the first few months of life. Permanent acquired immunity is usual after recovery from an attack.

Prevalence

Universal. Probably 80 to 90 percent of all persons surviving to the twentieth year of life have had an attack, and rarely does a person go through life without having had measles. Occurs most commonly in children between five and 14 years of age, but many cases are in children under five. Endemic in large population units.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms. Special attention to rise of temperature, Koplik spots, and catarrhal symptoms in exposed individuals.

Concurrent disinfection: All articles soiled with the secretion of the nose and throat.

Terminal disinfection: Thorough cleaning.

Investigation of source of infection: Search for exposed susceptible children under three years of age is profitable. Carriers are not known to occur. Every effort should be made to have all cases reported early in the disease by the physician, or, if there is none in attendance, by parent or guardian. The chief object of discovering cases is to give all possible protection to the very young or debilitated against infection, to administer

passive immunization if practicable, and to secure adequate medical care for those infected.

General Measures

Daily examination of exposed children and of other possibly exposed persons. This examination should include record of the body temperature. A nonimmune exposed individual exhibiting a rise of temperature of 0.5 degree C. (0.9 degree F.) or more should be promptly isolated pending diagnosis.

Schools should not be closed or classes discontinued, but daily observation of the children should be provided.

Education as to special danger of exposing young children to those exhibiting fever and acute catarrhal symptoms of any kind, particularly during years and seasons of epidemic prevalence of measles.

In institutional outbreaks, immunizations with gamma globulin of all minor inmates who have not had measles is of value in checking the spread of infection and in reducing mortality. No new admissions and no visitors under 16 years of age should be permitted in an institution for children during a measles outbreak in the community or in the institution.

Immunization

Who should be immunized

Passive immunization is advisable for modification and in certain cases for prevention of measles following known exposure. It is well to bear in mind that modified measles may not produce as lasting an immunity as an unmodified case.

Modification: Modification of the disease is more desirable than prevention in persons over three years of age who are in good health.

Prevention: Attempts should be made to abort completely the disease by passive immunization in infants and children *under the age of three years* and in debilitated older children or adults who are susceptible.

Administration

Immunizing agent: Immune serum globulin (human gamma globulin) is the product of choice. Immune serum globulin (human gamma globulin) in 2 cc. vials is distributed to local health departments and physicians by the State Department of Public Health. It is a concentrate containing the antibody globulins derived from normal human plasma which has been given to the Department by the American Red Cross.

Dosage: For modification: A dose of 0.02 to 0.025 cc., per pound of body weight, not to exceed 2.0 cc., should be given from the sixth to the eighth day following the first definite exposure.

For prevention: A dose of 0.08 to 0.1 cc., per pound of body weight, not to exceed 5.0 cc., should be given as soon after exposure as possible, but will be fairly effective during the first five days. A single dose will probably protect a child for about three weeks. At the end of that time, if the child is reexposed and protection is desired, the dose should be repeated.

Method: The globulin is injected intramuscularly, preferably in the buttocks. Aspiration is advisable in order to be sure the needle is not in a vein, since the globulin must not be given intravenously.

Untoward reactions following the administration of measles immune gamma globulin are rare. Reactions

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

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Section 2588. (a) The patient shall be isolated in accordance with Section 2518 during the period of catarrhal symptoms and for seven days after the appearance of the rash. Case

(b) *Adults*—no restrictions. Contacts

(1) *Immune children*—children giving evidence satisfactory to the health officer of having had the disease are not subject to any restrictions.

(2) *Nonimmune children*—nonimmune children shall be subject to the same isolation as the patient and kept under observation for two weeks from date of last exposure. If medical inspection is available and the child can be inspected daily before entering the classroom, this requirement may be waived, if, in the opinion of the local health officer, such procedure is advisable, and the child may continue school until the onset of symptoms. If the health officer is able to determine the definite date of exposure, the period of isolation may be from the seventh to the fourteenth day, if, in the opinion of the health officer, such a procedure is advisable.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach importance of:

a. Isolation when early catarrhal symptoms occur.
b. Use of immune serum globulin.
c. Observing patient for symptoms of complications during and after acute stage. (Frequent complications include: Bronchopneumonia, otitis media, laryngitis, enteritis.)
d. Having a chest X-ray about six months after illness.

Teach procedures for: Disposal of nose and throat discharges, terminal disinfection.

MENINGOCOCCUS MENINGITIS (CEREBRO-SPINAL FEVER), MENINGOCOCCEMIA

Recognition of the disease

The onset is usually sudden with fever, intense headache, nausea, and often vomiting, signs of meningeal irritation, and frequently a petechial skin rash. Delirium and coma may appear early. Occasionally fulminating cases occur, exhibiting signs of collapse and shock from the onset. Meningococci can usually be cultivated from the blood, the spinal fluid, and the nasopharynx. Meningococcemia without extension to the meninges is not uncommon and should be suspected in cases of otherwise unexplained febrile illness.

Etiologic agent

Meningococcus, *Neisseria meningitidis (N. intracellularis)*. Four main serologic types or groups are recognized. Group I has been more frequently found in epidemics in the United States.

Source of infection

Discharges from the nose and throat of patients and carriers, as the organisms are commonly carried in the nasopharynx. Carrier prevalence of 25 percent or higher may exist without the occurrence of cases. During epidemic periods more than half of a military organization may be healthy carriers of the strains of meningococci responsible for the epidemic.

Mode of transmission

By contact with infected persons, that is, sick persons or carriers. Indirect transmission may perhaps occur through contact with articles freshly soiled with discharges from the respiratory tract of infected persons.

Incubation period

Generally considered to be two to ten days, usually seven days.

Period of communicability

Until meningococci are no longer present in the discharges from the nose and mouth of patients. Following the administration of adequate amounts of sulfonamides, meningococci usually disappear from the nasopharynx within 24 hours.

Susceptibility and immunity

Susceptibility to the clinical disease is slight, as evidenced by the very low ratio of cases to carriers. The younger age groups are more susceptible, but the disease may occur at any age. In military personnel the majority of cases have occurred among those who have had less than 90 days of service. The type, degree, and duration of immunity following an attack of the disease is unknown. There is no generally accepted method for conferring immunity by artificial means.

Prevalence

Endemic and epidemic. There are no limits in geographic distribution. Sporadic cases occur throughout the year in both urban and rural areas with the greatest incidence during the winter and spring. The disease exhibits high incidence at irregular intervals. The epidemic wave lasts usually two or three years.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms confirmed by the microscopic and bacteriologic examination of blood or spinal fluids.

Concurrent disinfection: Of discharges from the nose and throat or articles soiled therewith.

Terminal disinfection: Cleaning.

Immunization: None.

Investigation of source of infection: Impracticable.

Prompt therapeusis of the patient and chemoprophylactic treatment of contacts with a sulfonamide drug such as sulfadiazine, under medical supervision, may be useful in limiting communicability and preventing secondary cases.

General Measures

Education as to personal cleanliness and necessity of avoiding contact and droplet infection.

Prevention of overcrowding such as is common in living quarters, transportation conveyances, working places, and especially in barracks, camps, and ships.

Epidemic Measures

Increase the separation of individuals and the ventilation in living and sleeping quarters for such groups of people as are especially exposed to infection because of their occupation or some necessity of living conditions. Chilling, bodily fatigue, and strain should be minimized for those especially exposed to infection.

If a community—civil, industrial, or military—is suffering from an unusual risk of infection and the general administration of chemoprophylaxis to exposed persons under medical supervision is practicable, small doses of sulfadiazine will lower markedly the carrier rate and prevent the spread of the disease.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic and cultural examination of spinal fluid from suspected cases.

Collection of specimens

Collect spinal fluid aseptically. Special mailing containers will be supplied upon request to the Division of Laboratories, but the standard Wassermann outfit may be used. Submit approximately 5 cc. spinal fluid in the sterile vial provided. Mark the accompanying report slip plainly "For Meningococcic Meningitis." If cell count is desired, please state.

Interpretation of results

Positive report: Organism typical of *Neisseria meningitidis* isolated.

Negative report: No organisms typical of *N. meningitidis* isolated or observed in smears of suspected spinal fluid.

Since *N. meningitidis (N. intracellularis)* remains visible for only a relatively short time outside the body, it is necessary to rush culture material to the laboratory as quickly as possible. For this reason it is recommended that the services of local public health or clinical laboratories which are properly equipped be sought when a case of meningococcic meningitis is suspected.

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(Meningococcic Infections)

Case

SECTION 2590. (a) The patient shall be isolated in accordance with Section 2518 until the end of the febrile period and until all acute symptoms have subsided.

Contacts

(b) If the patient is properly isolated, quarantine of contacts is not required, except at the discretion of the local health officer. Chemoprophylactic treatment of household contacts under medical supervision may be required by the health officer prior to release.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach need for prompt medical care of suspects.

Teach procedures for: Disposal of nose and throat discharges, care of linen, terminal disinfection.

MONONUCLEOSIS, INFECTIOUS

(Glandular Fever)

Recognition of the disease

An acute febrile infection with sore throat, fever, and often enlargement of cervical and other lymphatic glands and the spleen. The disease is accompanied by a characteristic lymphocytosis, and usually by the development of heterophile antibodies in the blood.

Etiologic agent

Unknown.

Source of infection

Probably discharges from the nose and throat of infected persons.

Incubation period

Varies from 4 to 14 or more days.

Mode of transmission

Direct contact with infected persons. The importance of articles soiled with discharges of infected persons is undetermined.

Period of communicability

Undetermined.

Susceptibility and immunity

Susceptibility apparently general, but greatest among children and young adults. The degree of immunity conferred by an attack is undetermined.

Prevalence

Observed in many parts of the world and is probably much more prevalent and more widely distributed than indicated by reported incidence. Epidemics are most frequently recognized in schools and children's institutions; the recognized incidence is comparatively high among medical students, nurses, hospital personnel, and among other groups having access to medical services where blood examinations are made routinely.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical symptoms, confirmed by examinations of blood smears and, when possible, tests for heterophile antibodies.

Isolation: None.

Concurrent disinfection: Of articles soiled with nose and throat discharges.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Should be undertaken, especially during epidemics, with the hope of adding to knowledge of disease.

General Measures

None.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination test on blood specimens.

Collection of specimen

Collect 5 cc. venous blood aseptically and place in sterile vial. Standard typhoid agglutination or Wassermann mailing outfits provided by the Division of Laboratories may be used, or upon request special containers will be provided. Mark

accompanying report slips plainly "For Infectious Mononucleosis."

Interpretation of results

Positive report: If agglutination of sheep erythrocytes is obtained in adsorbed serum in dilution 1-160 or higher.

Negative report: No agglutination of sheep erythrocytes obtained, or agglutination obtained only with unadsorbed serum.

Sheep cell agglutinins which may be present in normal serum and in serum sickness are removed by adsorption with *guinea pig kidney*. Sheep cell titers of infectious mononucleosis are not affected by the antigens of guinea pig kidney. When adsorptions are made with *beef cells* the sheep agglutinins from infectious mononucleosis and serum sickness are removed while those of normal serum are not. It has been shown that sheep cell agglutinins may persist in the blood for a year or more after treatment with horse serum. The failure of guinea pig kidney to affect the sheep cell agglutinin titer of the patient's serum is adequate evidence of infectious mononucleosis.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

MUMPS

(Infectious Parotitis)

Recognition of the disease

An acute specific infection characterized by fever and by swelling and tenderness of one or more of the salivary glands, usually of the parotid, sometimes of the sublingual or submaxillary glands. Involvement of ovaries and testicles is more frequent in persons past puberty; rarely, involvement of the central nervous system is encountered early or later in the course of the disease.

Etiologic agent

A specific filterable virus.

Source of infection

Secretions of the mouth and possibly of the nose.

Mode of transmission

By direct contact with an infected person or with articles freshly soiled with the discharges from the nose and throat of such infected persons.

Incubation period

From 12 to 26 days. The most common period 18 days, accepted as usual. A period of 21 days is not uncommon.

Period of communicability

Limits not definitely established, but probably beginning at least one to two days before development of distinctive symptoms and persisting no longer than the swelling of a salivary gland.

Susceptibility and immunity

Susceptibility believed to be general. Immunity follows an attack but second attacks of the disease are not rare. Brief passive immunity may follow inoculation with convalescent serum or whole blood.

Prevalence

This disease is decidedly less prevalent than the other common communicable diseases of childhood such as measles, whooping cough, and chickenpox. Winter and spring are the seasons of greatest prevalence. Its occurrence is sporadic and epidemic except in large cities, where it is endemic. Outbreaks occur more frequently and are of a more serious character in aggregations of young people, especially under conditions of military mobilization.

The Infected Individual, Contacts, and Environment

Methods of control

No procedures in common use can be relied upon as means of effective control of the disease: Recognition of the disease. The diagnosis is usually made on swelling of the parotid gland.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

General Measures

None.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Complement fixation tests on blood specimens.

Collection of specimens

Collect approximately 10 cc. venous blood aseptically as soon after onset as possible and again 12-14 days after onset.

Place blood in sterile rubber stoppered vials and send in mailing containers. These may be obtained upon request from the Division of Laboratories.

Complete accompanying report slip, being sure to give *date of onset, disease suspected, date of specimen,* and, for blood, whether first or second specimen. These data are essential to performance and interpretation of the tests.

Interpretation of results

Positive report: Depends on demonstrating the absence of antibodies in the acute phase specimen and presence of antibodies in the convalescent-phase specimen, or an increase in antibodies in the convalescent-phase specimen over the antibody content of the acute-phase specimen. If antibodies are present in the same amounts in both specimens, the antibodies are due to a previous infection or the first specimen was collected too late after onset of illness.

Negative report: Antibodies absent in both specimens or no rise in titer demonstrable.

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Case

SECTION 2592. The patient shall be isolated in accordance with Section 2518 during the period of initial symptoms and until the swelling of the salivary glands has subsided.

Contacts

SECTION 2592.1. No restrictions.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

a. Need for bed rest to prevent sequelae.
b. Reporting of symptoms of complicating sequelae (oöphoritis, orchitis, deafness, mastitis).

MYCOTIC INFECTIONS

(Miscellaneous)

(Including Blastomycosis, Moniliasis, Torulosis, Thrush)

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic and cultural examinations of body fluids, exudates, etc.

Collection of specimens

Collect body fluids, pus or other material from affected areas in sterile bottle provided in standard tuberculosis mailing outfit supplied by the Division of Laboratories.

If lesion is small, collect material on sterile swab. The swabs contained in the standard diphtheria mailing outfit may be used. Mark accompanying report slips plainly "For Pathogenic Fungi."

Interpretation of results

Positive: If microscopic and cultural examinations reveal the presence of one of the recognized pathogenic fungi, the species will be indicated.

Negative: No organisms typical of the recognized pathogenic types of fungi were demonstrable upon microscopic examination of specimen submitted.

PARATYPHOID FEVER

Recognition of the disease

A general infection with paratyphoid bacilli characterized especially by diarrheal disturbance, continued fever and involvement of the lymphoid tissues of the intestines, enlargement of the spleen, and a variety of constitutional symptoms, sometimes rose spots on the trunk. The infecting micro-organism may be found in the feces, blood, and urine.

Etiologic agent

Paratyphoid bacillus A, B, or C, etc: Salmonella groups.

Source of infection

Bowel discharges and urine of patients or carriers and food, water, or milk contaminated with such discharges of infected persons. Healthy carriers may be numerous in an outbreak.

Mode of transmission

Conveyance of paratyphoid bacilli by direct or indirect contact with patient or carrier. Among indirect means of transmission are contaminated food, water, milk, and shellfish, and, under some conditions, flies.

Incubation period

One to 10 days; somewhat longer for paratyphoid A than for B or C.

Period of communicability

As long as paratyphoid bacilli appear in the excreta. Usually from appearance of prodomal symptoms, throughout illness and relapses during convalescence, and for a varying period of time after final cessation of all symptoms.

Susceptibility and immunity

Susceptibility is general, though many adults appear to have acquired immunity through unrecognized infections. Acquired immunity of permanent duration usually follows recovery. Artificial active immunity of probably two years' duration can be developed by use of paratyphoid vaccine. Protection persists for about one year at a high level and can be maintained by periodic reimmunization with a single dose.

Prevalence

Frequency has fallen with that of typhoid fever until in most parts of North America it is relatively rare, occurring sporadically or in small local carrier or contact epidemics though probably more common than recognized infections. Paratyphoid A less common than B.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms aided by changes in specific agglutination and confirmed by bacteriologic examination of blood, bowel discharges, or urine.

Concurrent disinfection: Disinfection of all bowel and urinary discharges and articles soiled with them.

Terminal disinfection: Cleaning.

Investigation of source of infection: Actual or probable source of infection of every case should be determined by search for common and individual sources, (1) unreported cases and carriers, (2) contaminated food, water, milk, shellfish.

General Measures

Protection and purification of public water supplies; construction of safe private supplies.

Sanitary disposal of human excreta.

Pasteurization of milk and milk products and aging of cheese for not less than 60 days at 2 degrees C. (35 degrees F.)*

Limitation of collection and marketing of shellfish to those from approved sources.

Supervision of other food supplies, and of food-handling practices.

Prevention of fly breeding.

Discovery and supervision of paratyphoid carriers, and their exclusion from the handling of foods.

In event of epidemic, exclusion of suspected milk supplies on epidemiologic evidence pending discovery and elimination of the cause of contamination of the milk.

In event of epidemic, exclusion of suspected water supply, until adequate protection or purification is provided, unless all water used for toilet, cooking, and drinking purposes is boiled before use.

Education of general public and particularly of food handlers concerning sources of infection and modes of transmission.

Instruction of convalescents and chronic carriers in personal hygiene, particularly as to sanitary disposal of excreta, hand washing after use of toilet, and restraint from acting as food handlers.

Immunization

Vaccination against paratyphoid fevers A and B is performed concomitantly with vaccination against typhoid fever, by the use of triple vaccine, which includes paratyphoid antigens.

Since triple vaccine causes more severe reactions than typhoid vaccine alone, it should be used only when protection is required against the paratyphoid fevers A and B, as well as against typhoid. (See immunization section for typhoid fever.)

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Blood cultures.
Agglutination tests on blood specimens.
Cultures of feces and urine specimens.
Serologic typing of cultures.
Bacteriological examination of suspected food for organisms of the genus *Salmonella.*

Collection of specimens

Blood cultures: During the first 10 days of the disease, collect approximately 5 cc. venous blood aseptically, and place in special bottle containing bile medium which will be found in the standard typhoid agglutination and blood culture mailing outfit provided by the Division of Laboratories. Mark plainly accompanying report slip condition suspected "Salmonella Infection."

* For California legislation, see Agricultural Code, Division 4, Chapter 2, Article 6.

Blood for agglutination: At the same time blood is taken for culture, collect 5 cc. for agglutination test. Place in sterile vial provided in standard typhoid agglutination and blood culture mailing outfit supplied by the Division of Laboratories. Mark plainly on accompanying report slip condition suspected "Salmonella Infection."

Feces and urine specimens: Collect a portion of the stool approximately the size of a sphere one-half inch in diameter and emulsify in a glycerin solution contained in bottle marked "Feces," which is provided in the standard feces and urine mailing outfit supplied by the Division of Laboratories. If stool is liquid, collect 1-2 cc. and add to glycerin solution.

Collect 2-3 cc. urine and add to glycerin solution in bottle marked "Urine." Mark plainly on accompanying report slip condition suspected "Salmonella Infection."

Cultures for serologic typing: Should be submitted as soon after initial isolation as is possible. They should be sent on a solid, sugar-free medium (plain agar). Special containers will be supplied upon request to the Division of Laboratories. Information as to source of organism should be stated. Mark plainly accompanying report slip "For Salmonella Typing."

Suspected food for examination: Send suspected food to laboratory in suitable containers; accompany by description of symptoms and probable incubation period.

Interpretation of results

Blood culture: Positive report: Preliminary report—Indicates that an organism other than *E. typhosa* and appearing to belong to the genus *Salmonella* has been isolated. Final report—The specific serologic *Salmonella* type will be given.

Negative report: No *Salmonella* type organism isolated or no growth obtained from blood culture.

For early diagnosis, a blood culture is the best diagnostic aid. It should be taken during the first week of illness after which the organisms usually disappear from the blood stream. However, in case of negative findings, repeated specimens may be desirable. Isolation of a *Salmonella* species should establish the cause of the illness.

Agglutination tests: Positive report: Agglutination obtained in titer 1-80 or higher. Negative report: No agglutination or titer is below 1-80.

Agglutinins do not usually appear in the blood until 10-14 days after onset. The titer reaches its height during the third week of illness. Agglutinins produced as a result of a previous infection or of prophylactic vaccination may persist for an indefinite period of time. Therefore, their presence, in low titer especially, cannot in itself be considered diagnostic, but must be viewed in the light of clinical findings and past history of patient. A rise in agglutinin titer should be of diagnostic aid. Therefore, in case of negative findings or agglutinin in low titer, repeated specimens are recommended.

Feces and urine cultures: Positive report: Preliminary report—An organism other than *E. typhosa* and appearing to

belong to the genus *Salmonella* has been isolated. Final report—The specific serologic *Salmonella* type will be given.

Negative report: No organism resembling any known members of the *Salmonella* group isolated.

Cultures for serologic typing: Positive report: The specific *Salmonella* species will be given. Negative report: Organism does not conform culturally or serologically with any of the known types of *Salmonella.*

Suspected food: Positive report: Preliminary report—Organism resembling a *Salmonella* species isolated. Final report—Specific serologic type will be indicated.

Negative report: No organisms isolated resembling the *Salmonella* species.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Section 2594. (a) The period of isolation in accordance with Section 2516 shall be until the acute symptoms have subsided and two specimens of feces and urine taken successively at intervals of not less than five days have been determined by the laboratory to be negative for paratyphoid bacilli. The patient shall not take any part in the preparation, serving, or handling of milk or other food to be consumed by individuals other than his immediate family; nor shall he participate in the management of a dairy or other milk distributing plant, boarding house, restaurant, food store, or any place where food is prepared or stored; nor shall he engage in any occupation bringing him in contact with school children; until three successive feces and urine specimens taken at intervals of not less than five days have been determined by the laboratory to be negative for paratyphoid bacilli. **Case**

(b) No restrictions, except that no member of the household shall have any part in the preparation or serving of food to persons other than members of his immediate family; nor shall he engage in any occupation which brings him in contact with milk, milk products, milk bottles, or milk utensils. If members of the household are public food handlers and wish to resume their occupation, they shall leave the premises on which the case is isolated and submit at least two feces and urine specimens to the health officer and prove to the satisfaction of the health officer that they are free from infection before resuming their occupation. **Contacts**

(c) Sections 2628 (c) to 2628 (k), inclusive, shall apply to paratyphoid fever, as well as to typhoid fever.

Public Health Nursing Responsibility

Teach content included in above sections.

Encourage family to correct environmental hazards, such as flies, raw milk, poor sanitation.

Teach value of medical care for any case of diarrhea.

Teach procedure for: Care of linen, disposal of excreta, terminal disinfection.

PEDICULOSIS

(Lousiness)

Recognition of the condition

The discovery of the adult louse on some one or more of the hairy parts of the body or in the clothing, or the nits attached to hairs or to threads of body clothing. Irritation of the skin and adjacent adenitis may result from the scratching which the lousiness incites.

Infesting agent

Head or body louse *(Pediculus humanus)* and crab louse *(Phthirus pubis)*.

Source of infestation

Usually the hairy part of an infested person or, in the case of the body louse, the clothing of such a person.

Mode of transmission

Direct contact with an infested person and indirectly by contact with clothing and headgear of such persons.

Incubation period

Lice hatch in a week and reach sexual maturity in two weeks.

Period of communicability

While live lice remain on the infested person or in his clothing, and until eggs (nits) in hair and clothing have been destroyed.

Susceptibility and immunity

Neither term appropriate to such a condition as lousiness. Any person may become lousy under suitable conditions of exposure and lack of personal cleanliness.

Prevalence

Universal where there is neglect of washing of the person and the body clothing.

Methods of control

The Infested Individual, Contacts, and Environment

Recognition of the state of lousiness by direct inspection of school children for lice and nits and report to school authorities.

Isolation: Exclusion of the infested child from school until live lice are destroyed and supervision until nits are removed from the hair of the head.

Concurrent disinfestation: Such washing of person and treatment of body clothing and toilet articles as will destroy lice and nits.*

Terminal disinfestation: None.

Quarantine: None.

Investigation of source of infestation: Search for unreported and undetected cases of lousiness among companions, and especially among members of family and household.

General Measures

Direct inspection of the heads and, when necessary of the body and clothing where lousiness is found in groups either children or adults, particularly of children in schools, institutions, and camp groups.

Provision of facilities, chemical and physical, for freeing the persons and clothing of lice and nits.

Education in the value of bodily cleanliness by use of hot water and soap and of washing body clothing in a way to prevent the survival of lice.

* See Part III, Appendix, for discussion of use of DDT in disinfestation.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

Services available

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

PEMPHIGUS NEONATORUM

(Impetigo of the Newborn)

Recognition of the disease

A variety of bullous impetigo distinct from pemphigus in older children or in adults. It is to be differentiated from the bullous eruption of congenital syphilis, which is practically limited to the palms and soles, and is generally accompanied by other manifestations of that disease.

In most cases onset occurs between the fourth and tenth days of life, with the appearance of bullae which may come out on any part of the body but are apt to occur on the face or hands and other areas uncovered by clothing. These lesions rupture and form crusts and new bullae develop. Some may coalesce and gradually spread to involve large surfaces. Constitutional symptoms are at first absent but later weakness, and fever or a subnormal temperature, may be present.

Etiologic agent

Probably staphylococci or streptococci.

Source of infection

Infected infants, attendants, or visitors.

Mode of transmission

By direct or indirect contact with infected persons or articles contaminated by them.

Incubation period

Usually two to five days but sometimes much longer.

Period of communicability

Undetermined. May possibly persist after healing of the skin lesions.

Susceptibility and immunity

Infants and particularly the newborn are highly susceptible. Immunity is not produced by an attack.

Prevalence

Occurs occasionally in nursery wards. Likely to spread rapidly.

Methods of control

The Infected Individual, Contacts, and Environment

Provision of adequate facilities for early diagnosis and efficient treatment will usually prevent grave results.

Suitable isolation and aseptic technique should be observed when a case appears in a nursery for the newborn.

Prophylaxis

This is accomplished by removing vernix and blood with a soap-and-water bath immediately after delivery, which is followed by an inunction of 5 percent ammoniated mercury ointment. Subsequent daily care consists of cleansing with sterile vegetable oil. Further use of soap and water while the infant resides in the hospital should be limited to once a week. Scrupulous attention must be given to aseptic precautions, and to bedding, furnishings, gowns, and masks of attendants. Visitors should be excluded from nurseries. Parents or nurses who have colds, pimples, or dirty hands should not handle the infants, who should also be kept away from contact with street clothes.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

Services available

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

PERTUSSIS

(Whooping Cough)

Recognition of the disease

An acute infection involving the trachea and bronchi and characterized by a typical cough usually lasting from one to two months. The initial catarrh usually has an insidious onset manifested by an irritating cough. The cough gradually becomes paroxysmal usually within one to two weeks. The paroxysms are characterized by a repeated series of violent coughs, each series consisting of many coughs without intervening inhalation and often followed by the characteristic, sonorous, inspiratory whoop. Paroxysms frequently end with vomiting of clear, tenacious mucus. Many cases of pertussis occur without paroxysmal cough. The etiologic agent has been recovered by use of special culture plates exposed before the patient's mouth during a cough in the catarrhal and early paroxysmal stage of the disease and by the use of nasal pharyngeal swabs. Culture plates should be incubated promptly. A definite lymphocytosis is usually present.

Etiologic agent

Pertussis bacillus of Bordet and Gengou, *Hemophilus pertussis*.

Source of infection

Discharges from the laryngeal and bronchial mucous membranes of infected persons.

Mode of transmission

Contact with an infected person, or with articles freshly soiled with the discharges of such person.

Incubation period

Commonly seven days, almost uniformly within 10 days, and not exceeding 21 days.

Period of communicability

Particularly communicable in the early catarrhal period before the typical cough confirms the clinical diagnosis. After the typical paroxysms are established, communicability gradually decreases and becomes negligible for ordinary nonfamilial contact in about three weeks, even though the spasmodic cough with whoop may persist. The communicable stage must be considered to extend from seven days after exposure to an infected individual to three weeks after onset of typical paroxysms.

Susceptibility and immunity

Susceptibility is general. There is no natural immunity. Children under seven years of age are most susceptible to attack and those under two years of age to fatal attack. One attack confers a definite and prolonged immunity, although second attacks do occur. Susceptibility is apparently higher in females at all ages than in males. Both passive and active artificial immunity may be developed by appropriate agents.

Prevalence

Very prevalent, and a common disease among children everywhere regardless of race, climate, or geographic location. Although approximately 15 percent of the cases occur in children under two years of age, 85 percent of the deaths occur in this age group. Seasonal incidence variable, but mortality higher usually in spring months in North America. Cyclical occurrence irregular.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms.

Concurrent disinfection: Discharges from the nose and throat of the patient and articles soiled with such discharges.

Terminal disinfection: Thorough cleaning.

Investigation of source of infection: An effort should be made to discover undiagnosed and unreported cases, with the main object in view of protecting young children from exposure, and thus reducing the mortality. Postponement of the age of infection at least until school age and great care in the management of the disease in young children offer some hope of reducing deaths from whooping cough, although reduction of incidence by any means appears unlikely. Carriers in the exact sense of this term are not known to occur.

General Measures

Education in habits of personal cleanliness and in the dangers of association or contact with those showing catarrhal symptoms with cough.

Immunization

Who should be immunized

All children between the ages of six months and five years. Immunization of older children is not routinely recommended as a public health procedure, but it is of value in areas where early immunization was not done. Immunization of younger infants, starting at six weeks to three months of age, is proving effective in lowering the mortality, although it may not always prevent the disease. Since the young infant is highly susceptible from birth and the mortality is highest in the first six months of life, the avoidance of exposure by immunization of the older non-immune siblings is of the greatest importance in the control of this disease.

Initial series: If the child is not under regular supervision immunization should be started at six months or as soon thereafter as possible, at which time it is advisable to combine immunization with diphtheria and with tetanus, if immunization against the latter is also being carried out. May begin immunization with alum precipitated vaccine at six weeks of age if the infant is under regular supervision during this period.

Immunizing agent: Hemophilus pertussis Phase I vaccine grown on a blood media. In infants and children over six months and under five years of age, it is preferable to combine pertussis vaccine with diphtheria toxoid, and with tetanus toxoid, if immunization against the later is also being carried out.

Dosage and interval (in public health practice):

Initial series: For alum precipitated products, two injections of 1 cc. each at monthly intervals will give a total of 40,000 million organisms. The number of organisms in the combined diphtheria-pertussis and diphtheria-pertussis-tetanus alum precipitated products is approximately one-half the number in

the plain products. There is good evidence, however, that the alum precipitated products give equal or better protection and are to be preferred in public health practice.

For plain pertussis vaccine, a satisfactory initial series consists in administering a total of 100,000 million organisms deep subcutaneously or intramuscularly in three doses of 0.5 cc., 1 cc., and 1 cc. at monthly intervals.

Reinforcing injections: A "booster" injection of 0.5 cc. of alum precipitated products should be given at one year after the initial series, or at almost two years of age, and should be combined with diphtheria and/or tetanus toxoid, if they were included in the first series.

For the infants who receive pertussis immunization very early (three months or earlier), followed by diphtheria toxoid, or a diphtheria-tetanus combination at six to nine months, the "booster" for pertussis can be included in the third injection against diphtheria (using D.P.) or diphtheria-tetanus (using D.P.T.)

Reactions: Severe reactions to pertussis vaccine or combined diphtheria-pertussis-tetanus products are rare in children under five years of age. Injections should not be repeated in the same skin area.

Passive immunization and treatment

Special hyperimmune human globulin is recommended for prophylaxis and treatment, especially of the very young infant. This provides a brief passive partial immunity and is of particular value for use with the very young infant in whom the disease may be highly fatal. The effectiveness of streptomycin has not yet been determined.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Cough plate cultures.
Serological tests.
Lymphocyte counts.

It is not feasible to make these examinations at the State Division of Laboratories; therefore, it is recommended that physicians desiring the aid of laboratory tests in the diagnosis of this disease avail themselves of the services of local public health or private laboratories.

Collection of specimens

Contact local laboratory for specific instructions.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

SECTION 2638. (a) The patient shall be isolated in accordance with Section 2518 during the early catarrhal period and for 21 days after the appearance of the typical paroxysmal cough.

Contacts

(b) (1) *Immune children*—Children giving evidence satisfactory to the health officer of having had the disease are not subject to any restrictions.

(2) *Nonimmune children*—Nonimmune children shall be subject to the same isolation as the patient and kept under observation for 10 days after the last exposure. If medical

inspection is available and the child can be inspected daily before entering the classroom, this requirement may be waived, if, in the opinion of the local health officer, such procedure is advisable, and the child may continue school until the onset of symptoms.

Public Health Nursing Responsibility

Teach content included in above sections.
Teach importance of:

a. Active immunization beginning in infancy, giving information about local resources for obtaining it.
b. Isolation at first signs of coryza, cough or malaise.
c. Protection of infants to avoid exposure.

Teach parents:

a. To pick up sick infants during paroxysm to prevent mucus inhalation and give abdominal support.
b. To see that patient receives and retains the proper amount of food and fluid.

Teach procedures for: Disposal of nose and throat discharges, care of dishes, care of linen, terminal disinfection.

PINWORM INFECTION

(Enterobiasis)

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of anal swabbings for ova of *Enterobius* (Oxyuris) *vermicularis.*

Identification of adult worms passed in feces.

Collection of specimens

For ova, collect specimens in the morning only and immediately after patient has awakened. To collect eggs deposited by worms during patient's sleep, use cellophane swab or scotch tape patches. Containers will be supplied upon request.

For identification of adult worms, place samples of feces in bottle provided in standard mailing outfit for amoebic dysentery. Mark accompanying report slip plainly "For Pinworms."

Interpretation of results

Positive report—Ova or adult worm identified microscopically as *Enterobius vermicularis.*

Negative report—No ova or adult worm demonstrated resembling *E. vermicularis.*

PLAGUE

Recognition of the disease

An acute infection running a rapid severe course, often terminating fatally, and characterized by extreme weakness, high fever, buboes, severe general symptoms, and sometimes accompanied by subcutaneous hemorrhage and pustules. The infecting micro-organism is regularly found in the buboes and skin lesions, and in the pneumonic type of the disease in the sputum. Pneumonic plague gives the picture of a virulent septic pneumonia.

Etiologic agent

Plague bacillus, *Pasteurella pestis*.

Source of infection

Blood of infected rodents and, in the pneumonic form, the sputum of human cases. The primary or indigenous source of the disease is the so-called "sylvatic plague," the animal reservoir among such rodents as the tarbagan of Manchuria, and the ground squirrel and other rodents of the United States. Infection may reach man from these sources, or more often through the medium of the rat.

Mode of transmission

Direct, in the pneumonic form. In other forms the disease is generally transmitted by the bites of fleas (*Xenopsylla cheopis* and certain other species), by which the disease is carried from rats to man, also by fleas from other rodents. Accidental, by inoculation.

Incubation period

Commonly from three to six days, although occasionally longer.

Period of communicability

Pneumonic type often intensely communicable during acute symptoms. Bubonic type not communicable from person to person.

Susceptibility and immunity

Susceptibility is general, particularly to the pneumonic form. Natural immunity may exist but is rare. Lasting immunity almost always results from recovery from an attack of the disease. Artificial passive immunity of about three to four weeks' duration by antiplague serum, and active immunity of about six months' duration by vaccines may be relied upon.

Prevalence

Very rare in North America and insular possessions, and only sporadic cases, from exposure to infection in ground squirrels and other rodents west of the Mississippi. Focally distributed in various parts of the world.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms, confirmed by bacteriologic examination of blood, pus from glandular lesions, or sputum. Animal inoculation of material from suspected cases. Investigation of all deaths during epidemics with autopsy and laboratory examination when indicated.

Concurrent disinfection: Sputum and articles soiled therewith, in pneumonic type of the disease.

Terminal disinfection: Thorough cleaning followed by fumigation to destroy rats and fleas. Handling of the bodies of persons dying of plague under strict antiseptic precautions.

Investigation of source of infection: Search for human (in pneumonic) and rodent (in bubonic) sources to which patient

is known to have been exposed, among wild rodents, and particularly the rat.

General Measures

Extermination of rats and vermin by use of known methods for their destruction; destruction of rats on ships arriving from infected ports; examination of rats, ground squirrels, etc., in areas where the infection persists, for evidence of endemic or epidemic prevalence of the disease among them.

Ratproofing of buildings and elimination of breeding places and opportunities for the harboring and feeding of rats as a fundamental sanitary measure.

Ratproofing of ships.

Epidemic Measures

Widespread active immunization in the affected community may be undertaken. DDT spraying of all premises.

Immunization

Who should be immunized

Practical only for persons who will be exposed to unusual risks of infection.

Administration

Immunizing agent and dosage: A biologic firm supplies a commercial plague vaccine consisting of a saline suspension of 2,000 million killed plague bacilli per cc. An initial injection of 0.5 cc., is given subcutaneously, followed in 7-10 days by a second injection of 1.0 cc. A reinforcing injection of 1.0 cc. is given six months after the original immunization, or at the time of exposure. Results are said to be uncertain.

Reactions

Severe reactions are uncommon. Local and systemic reactions of a moderate nature may occur.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Bacteriological and cultural examination of material aspirated from buboes, whole blood or of sputum in pneumonic type.

Examination of animal tissues and ectoparasites.

Collection of specimens

Whenever a human case of plague is suspected, communicate immediately by telephone or telegraph with the State Division of Laboratories for instructions.

Animal tissues and ectoparasites are collected under the supervision of the Bureau of Vector Control of the State Health Department, or by rodent control officers of local health departments. Special containers are provided by the Division of Laboratories.

Interpretation of results

Positive report: Indicates that *Pasteurella pestis* has been isolated and identified by animal inoculation and cultural methods from material submitted.

Negative report: The presence of *P. pestis* was not demonstrated.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

SECTION 2596. (a) The local health authority shall communicate immediately with the Director, State Department of

Public Health, by telephone or telegraph regarding the case or suspected case. The period of isolation shall not be terminated until two days after all symptoms have subsided. All laboratory specimens submitted for the purpose of establishing a diagnosis shall be examined *only* in such laboratories as may be designated by the Director, State Department of Public Health.

(b)* Whenever a laboratory receives a specimen for the laboratory diagnosis of suspected human plague, such laboratory shall communicate immediately by telephone or telegraph with the State Laboratory for instructions.

Contacts

(c) Contacts of cases of plague shall be kept under quarantine until the health officer is satisfied that they have not contracted the infection, except that contacts of cases of pneumonic plague shall be kept in quarantine for a period of at least seven days after last exposure.

Public Health Nursing Responsibility

When plague or suspected plague is the diagnosis, public health nurses must function *only under direct orders of the health officer*. When the diagnosis is pneumonic plague, the public health nurse should avoid exposure. If she is exposed, she becomes a contact and is quarantined. If the health officer orders the nurse to enter the patient's home, she must first be immunized. In place of her bag she takes the following articles wrapped in newspaper:

a. Bar of soap or tube of shaving soap.
b. Supply of paper towels.
c. Gowns which insure complete covering.
d. Supply of masks.
e. Rubber gloves.
f. Goggles.
g. Head covering large enough to meet gown at neck.
h. Thermometer.
i. Supply of cotton pledgets in glass jar.
j. Generous supply of newspapers.

These materials may be destroyed subsequently by burning or sterilized and are not removed from the home until quarantine is lifted.

Nurse and attendant must be completely protected with gowns, masks, goggles and head coverings before entering patient's room.

Nurse is allowed to give verbal instructions to the attendant to avoid her own exposure.

The pneumonic plague patient is masked while care is being given.

Teach procedures for: Burning of all nose and throat discharges, boiling of linen, dishes, masks and gowns, burning uneaten food, all excreta and uneaten liquid foods must be disinfected before flushing down toilet or depositing in privy.

* Identical with Section 1079 (b), Chapter 2, California Administrative Code, Title 17, Public Health.

PNEUMONIA

I. PNEUMOCOCCAL PNEUMONIA, ACUTE LOBAR PNEUMONIA

Recognition of the disease

An acute infection characterized by sudden onset with chill followed by fever, often pain in the chest, usually cough and dyspnea. In children, vomiting and convulsions often occur at the onset. Identification of the infecting micro-organism by the Neufeld reaction and cultural examination is valuable. The X-ray may disclose pulmonary lesions prior to other evidences of consolidation. Not infrequently and especially in children pneumococcal pneumonia may appear of bronchial rather than lobar type.

Etiologic agent

Pneumococci types I to XXXII, inclusive, account for about 95 percent of the cases, the remaining are due to the more rarely recognized types. *Streptococcus hemolyticus* produces an atypical pneumonia, interstitial in type, which may be confused with lobar pneumonia.

Source of infection

Probably discharges from the mouth and nose of infected persons and articles freshly soiled with such discharges.

Mode of transmission

By direct contact with infected person, or with articles freshly soiled with the discharges of the nose and throat of such persons, and possibly from minute suspended particles containing the etiologic agent. Incidence of carriers is much higher than that of cases.

Incubation period

Believed to be short, usually one to three days—not well determined.

Period of communicability

Unknown; presumably until the discharges of the mouth and nose no longer carry the infectious agent in an abundant amount or in a virulent form.

Susceptibility and immunity

Resistance is generally high but may be lowered by wet, cold, and exposure, and apparently under certain conditions by bodily and mental fatigue, and by alcoholism. Acquired immunity to the particular micro-organism may follow an attack of pneumonia; such immunity is apparently of short duration and is highly specific. Artificial immunization whether active or passive is of questionable value.

Prevalence

Common, and affecting at one time or other, between adolescence and old age, a large proportion of the population. No race or color and neither sex is exempt from likelihood of having this disease. Occurs in all climates and seasons, but most often in winter and spring and in regions where cold, windy, changeable, and inclement weather prevails. Occurs in epidemic form, particularly in institutions for adults.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms. Specific infecting organisms may be determined by serologic and bacteriologic tests early in the course of the disease, which may give basis for specific therapy.

Concurrent disinfection: Discharges from the nose and throat of the patient.

Terminal disinfection: Thorough cleaning and airing.

Immunization: None.

Prompt treatment with an appropriate chemotherapeutic agent or a combination of serotherapy and chemotherapy, may be useful in limiting communicability.

General Measures

Whenever practicable and particularly in institutions, barracks, and on shipboard, crowding in living and sleeping places should be avoided. The general resistance should be conserved by good food, fresh air, sufficient sleep, temperance in the use of alcoholic beverages, and other hygienic measures.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

No laboratory services available.

II. BACTERIAL PNEUMONIA, OTHER THAN PNEUMOCOCCAL

Recognition of the disease

Symptoms of acute febrile disease with evidence of pulmonary involvement, from symptoms, physical signs, or X-ray. Often occurring in association with or as a complication of respiratory virus diseases.

Etiologic agent

Various pathogenic bacteria of the mouth, nose, and throat, as the streptococcus, staphylococcus, *Klebsiella pneumoniae* and *Hemophilus influenzae*.

Source of infection

Probably discharges from the mouth and nose of an infected person, or articles soiled by such discharges.

Mode of transmission

By direct contact with infected person or with articles freshly soiled with discharges of nose or throat of such person.

Incubation period

Variable, usually short.

Period of communicability

Unknown; probably while the virulent organisms are given off in the discharges of the nose and throat of patients.

Susceptibility and immunity

Susceptibility appears to be low; highest in infants and young children. There is no evidence that an attack confers lasting immunity.

Prevalence

Common only during epidemic influenza or other respiratory infections.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: Clinical symptoms, roentgenograms, and isolation of the causative organism in the acute stage of the disease.

Concurrent disinfection: Discharges from mouth and nose of patients.

Terminal disinfection: Thorough cleaning and airing.

Immunization: None.

Investigation of source of infection: Of no practical value. Prompt use of chemotherapy is important in suitable cases.

General Measures

Good personal hygiene, with care to avoid crowding in institutions and hospitals.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

III. PRIMARY ATYPICAL PNEUMONIA

Recognition of the disease

Characterized by insidiousness, variability of onset, and frequent absence of respiratory symptoms. Presenting symptoms are usually fatigue, muscle pains, chilliness, feverishness, and occasional cough. Diagnosis often first made on X-ray examination. White count usually low in proportion to temperature. Pulmonary lesions irregular in distribution and patchy in appearance.

Etiologic agent

The causative agent of the majority of atypical pneumonia is probably a virus. Must rule out rickettsial diseases.

Source of infection

Probably discharges from the mouth and nose of infected persons or articles freshly soiled with such discharges.

Mode of transmission

By direct contact with infected person or with articles freshly soiled with discharges of nose and throat of such person. Mild, unrecognized infections may play a role in the spread of the disease.

Incubation period

Uncertain. Believed to be 7 to 21 days.

Period of communicability

Undetermined.

Susceptibility and immunity

A low incidence in the general population and a low attack rate among contacts of cases suggest a relatively high resistance to the disease. It is not known whether an attack confers significant immunity.

Prevalence

Occurs endemically and in epidemics at all seasons. Incidence is variable. In outbreaks in army camps attack rates of from 1 to 6 percent of the troops per year have been reported. Similar attack rates are reported in civilian hospitals and institutions. Occurs in both sexes and at all ages, but is more frequent in adolescents and young adults.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: Clinical symptoms, confirmed by roentgenograms of the chest.

Concurrent disinfection: Discharges from nose and throat of patient.

Terminal disinfection: Thorough cleaning and airing.

Immunization: None.

Investigation of source of infection: Of no practical value. (Contrast with psittacosis.)

General Measures

When possible, crowding in living and sleeping quarters should be avoided, especially in institutions, in barracks, and on shipboard. General resistance should be guarded by adequate food, sufficient sleep, fresh air, and good personal hygiene.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Cold agglutination of primary atypical pneumonia.
Complement fixation for psittacosis or related viruses.
(Both tests are run routinely on all blood specimens submitted for virus pneumonia, primary atypical pneumonia, or psittacosis.)
Isolation of virus from sputum or lung tissue.

Blood for Cold Agglutination and Complement Fixation

Collection of specimens

Two specimens of serum are necessary. The first should be taken as soon as possible after the onset, and the second 14-21 days after the first. Collect approximately 20 cc. venous blood aseptically and send in a sterile vial. Containers will be supplied on request to the Division of Laboratories. Tests will not be run on single specimens as they are of no diagnostic significance unless a rise in titer can be demonstrated.

Specimens for Virus Isolation

Sputum.
Lung tissue.
Ship in rubber-stoppered tubes or jar with air-tight rubber gasket packed in dry ice *(important to pack specimen in dry ice immediately after collection. Must not thaw before reaching laboratory.)*
Complete accompanying report slip, being sure to give *date of onset, disease suspected, date of specimen,* and, for blood whether first or second specimen. These data are essential to performance and interpretation of the tests.

Cold Agglutination for Primary Atypical Pneumonia

Interpretation of results

Positive report: Agglutination at a dilution of 1-20 or higher confirmed by rising titer indicates primary atypical pneumonia. A common, usually mild, form of virus pneumonia transmitted from one human being to another thus differing from psittacosis (see below).
Negative report: No agglutination in either acute-phase or convalescent serum. (Negative cold agglutination does not rule out primary atypical pneumonia as in about half of the cases of this disease cold agglutinations do not develop.)

Complement Fixation for Psittacosis Group

Positive report: A fourfold or greater rise in titer between the first and second serum specimens is considered positive. This result indicates infection with a virus of the psittacosis group from parrots, canaries, pigeons, chickens, or other bird or animal sources.

Negative report: No change in titer or negative complement fixation.

Virus Isolation

Positive report: Specific virus isolated and identified.

Negative report: No isolation or detection of virus by laboratory methods used.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH*

SECTION 2598. The patient shall be isolated in accordance with Section 2518 until clinically recovered. These cases should include cases of acute lobar pneumonia and those cases known to be infectious or suspected of being infectious. This includes the virus types of pneumonia.

Public Health Nursing Responsibility

Teach content included in above sections, as well as:

a. Good dietary and hygienic habits of daily living.
b. Exclusion from school at first sign of a cold as a means of preventing pneumonia.
c. Adequate convalescence in cases of measles, whooping cough and other diseases in which pneumonia is a frequent complication.
d. Resting in bed at onset of a cold.
e. Calling physician when any sudden change occurs in the condition of a pneumonia patient.

Teach procedures for: Disposal of nose and throat discharges, terminal disinfection.

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* These regulations apply to all diseases under section on Pneumonia, i.e.:
A. Pneumococcal—Acute Lobar Pneumonia.
B. Bacterial Pneumonia, other than Pneumococcal.
C. Primary Atypical Pneumonia.

POLIOMYELITIS

Recognition of the disease

An acute infection with moderate initial fever, usually headache and gastrointestinal symptoms such as vomiting and constipation, drowsiness alternating with irritability, hyperesthesia, stiffness of neck and spine, usually accompanied by an increase in pressure and in the number of cells in the spinal fluid, tremor, and exaggeration of the muscular reflexes. Later, local diminution of reflexes and local motor weakness (paralytic). Any of these symptoms may be absent but the diagnosis of the cases which are not at some time paralytic is so frequently uncertain that only paralytic cases should be counted officially as poliomyelitis in comparing rates, due precautions being taken in the other cases. Paralysis may be sudden and cause death within a few hours of onset by cessation of respiration without clear-cut symptoms. There is a marked tendency for the paralysis to improve after it has reached its height.

Etiologic agent

A specific filterable virus.

Source of infection

Nose and throat discharges of infected persons, more frequently those not suffering from a clinically recognized attack of the disease. Bowel discharges contain the virus.

Mode of transmission

The virus probably enters the body by way of the nose or mouth, presumably from a carrier or a person with a subclinical infection in most instances. Though the virus has been found in flies subject to fecal contamination, there is no good evidence of insects serving as vectors. Reliable evidence of spread by water supply is lacking.

Incubation period

Considered to be seven to 14 days.

Period of communicability

Not definitely known, but apparently covered by the latter part of the incubation period and the first week or two of the disease—possibly much longer in a few cases.

Susceptibility and immunity

Children are more frequently susceptible than adults except in extremely isolated communities not previously reached by the infection. Immunity is usually high among adults who have lived in large cities, less among those in rural sections. An attack of the disease apparently gives permanent immunity. Second attacks are rare although they have been observed. Even during epidemics only one person in several hundred suffers a clinical attack of the disease.

Prevalence

Infection occurs practically throughout the world, but cases are most frequent in the cooler part of the temperate zone, occurring both sporadically and in epidemics at irregular intervals, with the highest incidence in late summer and fall. In northern United States an annual incidence of 10 cases per 100,000 population is ordinary.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms, assisted by microscopic and chemical examination of the spinal fluid if lumbar puncture is performed.

Almost invariably the period of restriction of visitors and care in bed desirable for the patient extends beyond the period of presumed communicability of the disease.

Concurrent disinfection: Nose, throat, and bowel discharges, and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Search for and expert diagnosis of sick children to locate unrecognized and unreported cases of the disease.

General Measures During Epidemics

General warning to physicians and the laity of the prevalence or increase of incidence to the disease, the description of usual characteristics of onset, and necessity for diagnosis and medical care, particularly for bed rest of patients.

All children with fever should be isolated in bed pending diagnosis.

Education in such technique of bedside nursing as will prevent distribution of infected discharges to others from cases isolated at home.

Protection of children so far as practicable against unnecessary contact with other persons, especially those outside their own homes, during epidemic prevalence of the disease.

Postponement of nose and throat operations on children in the presence of an epidemic.

Avoidance of physical strain in children during an epidemic or in case of known exposure.

Avoidance of unnecessary travel and visiting during high prevalence of the infection.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

None. The virus is present in nasal and pharyngeal secretions and in the feces during certain phases of illness. Virus has been demonstrated experimentally by inoculation of monkeys with these materials or with tissues from the central nervous system. No susceptible animal other than the monkey is available. No satisfactory serological tests have been devised.

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Case

SECTION 2600. The period of isolation shall be in accordance with Section 2516 for at least 14 days from the onset of illness and thereafter until all acute symptoms have subsided.

Household contacts

SECTION 2600.1. Household contacts shall be quarantined until patient is eligible for release, except that, at the discretion of the health officer, the wage earners may be released from the

quarantined area to live elsewhere, provided their occupations do not bring them in close association with other persons. In the event the case is removed from the quarantined area by reason of death or hospitalization, quarantine of household contacts will continue for 14 days following such release, with exception for wage earners as noted above.

Casual contacts

SECTION 2600.2. Casual contacts shall be placed under observation for a period of at least 14 days after last exposure.

Public Health Nursing Responsibility

Teach content included in above sections.

Participate in community education during epidemics.

Correct misinformation regarding quick cures, treatment, prevalence, mode of spread.

Relieve anxieties and fears of the patient and family as much as possible.

Help family to plan for good bed posture of the patient when he is cared for at home.

a. Board under mattress which fits bed in length and width.
b. Felt mattress is best.
c. Foot board as illustrated in reference.
d. Preparation of bed as illustrated in reference. For specific aids in nursing care every nurse should own and use: Pamphlet 45, "*A Guide for Nurses in the Nursing Care of Patients with Infantile Paralysis,*" National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York 5, New York. Pamphlet 46A, "*The Guide for Parents,*" obtainable from the same source, should be available locally to supplement teaching of the nurse.

Teach procedures for: Disposal of nose and throat discharges, disposal of feces.

PSITTACOSIS

Recognition of the disease

The clinical criteria are an onset with chilly sensations, fever, headache; early pneumonic involvement; cough absent or usually nonproductive at first, later usually present and productive; sputum light yellow and characterized by extreme viscosity; tongue, white coat; anorexia extreme; constipation the rule; pulse usually slow in relation to temperature; great prostration; delirium common; albuminuria almost constant; relapses not uncommon. The white blood count is normal or slightly increased early, with leucopenia later. The disease may be transmitted to mice by intraperitoneal inoculation of blood drawn during first week of illness; the diagnostic criteria are the characteristic pathologic changes in mice with the presence of elementary bodies (Leventhal-Coles-Lillie) in impression smears from the spleens of mice; the sputum, if obtainable, is more uniformly infectious than the blood; repeated trials are necessary. Blood serum of recovered cases contains complement-fixing antibodies.

Etiologic agent

A specific filterable virus.

Source of infection

Parrots, parakeets, love birds, canaries, pigeons, and other birds. Birds which are apparently well occasionally transmit the infection.

Mode of transmission

Contact with infected birds or their recent surroundings. Occasionally through a human case.

Incubation period

In human cases, 6 to 15 days.

Period of communicability

Ill birds and their surroundings highly infectious for man; patients less dangerous. The period of communicability of human cases is during their acute illness, especially when coughing.

Susceptibility and immunity

All ages susceptible, but the disease is more severe in the higher age groups. One attack confers immunity.

Prevalence

Usually in sudden household outbreaks among persons exposed to ill tropical birds. Deaths mainly confined to persons over 30 years of age. Milder cases not infrequent from slight exposure to pigeons or other birds not necessarily ill.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms, assisted by finding the virus in the sputum if possible, or the blood during first week of illness. Blood for complement fixation tests should be drawn as early as possible in the disease and again later to show rise in titer.

When actually handling patients with a cough, nurses should wear gauze masks, eight layers of 40 to 48 threads per inch, or 16 layers 20 to 24 threads per inch.

Concurrent disinfection: Of all discharges.

Terminal disinfection: Incriminated birds should be killed and their bodies immersed in 2 percent cresol. The spleens then should be aseptically removed, part placed in equal parts of sterile glycerin and standard phosphate buffer solution of pH 7.5, and part in suitable fixative, and both specimens sent to

the Division of Laboratories for examination. Carcasses should be burned before feathers dry. Buildings which housed birds should be quarantined until thoroughly cleaned and disinfected.

Immunization: No demonstrated method yet fully accepted.

Investigation of source of infection: Important, in order to trace infected lots of birds. Though apparently healthy birds occasionally convey the disease, healthy human carriers are unknown.

General Measures

Quarantine of homes and pet shops known to have harbored infected birds until thoroughly cleaned.

Education of community in the danger of making house pets of birds of the parrot family, particularly when the birds have been recently imported or are of doubtful history as to contact with other and especially with sick birds.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

(Primary Atypical Pneumonia and Virus Pneumonia of the Psittacosis Group)

Services available

Cold agglutination for primary atypical pneumonia.

Complement fixation for psittacosis or related viruses.

(Both tests are run routinely on all blood specimens submitted for virus pneumonia, primary atypical pneumonia, or psittacosis.)

Isolation of virus from sputum or lung tissue.

Collection of specimens

Blood for cold agglutination and complement fixation: Two specimens of serum are necessary. The first should be taken as soon as possible after the onset, and the second 14-21 days after the first. Collect approximately 20 cc. venous blood aseptically and send in a sterile vial. Containers will be supplied on request to the Division of Laboratories. Tests will not be run on single specimens as they are of no diagnositic significance unless a rise in titer can be demonstrated.

Specimens for virus isolation from sputum or lung tissue: Ship in rubber-stoppered tubes or jars with air-tight rubber gasket packed in dry ice. *(Important to pack specimen in dry ice immediately after collection. Must not thaw before reaching laboratory.)*

Complete accompanying report slip, being sure to give *date of onset, disease suspected, date of specimen,* and, for blood, whether first or second specimen. These data are essential to performance and interpretation of the tests.

Interpretation of results

Cold agglutination for primary atypical pneumonia: Positive report: Agglutination at a dilution of 1-20 or higher confirmed by rising titer indicates primary atypical pneumonia. A common, usually mild, form of virus pneumonia transmitted

from one human being to another thus differing from psittacosis (see below).

Negative report: No agglutination in either acute-phase or convalescent serum. (Negative cold agglutination does not rule out primary atypical pneumonia as in about half of the cases of this disease cold agglutinins do not develop.)

Complement fixation for psittacosis group: Positive report: A fourfold or greater rise in titer between the first and second serum specimens is considered positive. This result indicates infection with a virus of the psittacosis group from parrots, canaries, pigeons, chickens, or other bird or animal sources.

Negative report: No change in titer or negative complement fixation.

Virus isolation: Positive report: Specific virus isolated and identified.

Negative report: No isolation or detection of virus by laboratory methods used.

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SECTION 2602. (a) The patient shall be isolated in accordance with Section 2518 during the acute stages. No restrictions need be placed on the contacts.

(b) Importation of psittacine birds.

(1) The importation into the State of California of all birds of the psittacine family (Psittacidae) from foreign ports or ports in the possessions and dependencies of the United States or other states, shall be under the same conditions as imposed by the United States Government Regulations. Title 42, Chapter I, Part II, Foreign Quarantine Sections 11.152 and 11.153, Revised May 27, 1946; and Part 12, Interstate Quarantime, Section 12.22, Revised June 16, 1947.*

(2) A certificate shall be presented for any privately owned shipment transported into or out of California.

(c) Aviary Records: All dealers in birds of the psittacine family (Psittacidae) shall be required to keep a record for at least two years of each transaction. This record shall include the number of birds purchased or sold, the date of the transaction, the name and address of the person from whom purchased or to whom sold.

All records of sales, exchanges or purchases herein prescribed shall be available for official inspection at all times.

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* Federal Interstate Regulations:

"Psittacine birds. (2) The term psittacine birds shall include all birds commonly known as parrots, amazons, Mexican double heads, parakeets, African grays, cockatoos, macaws, love birds. lories, lorikeets, and all other birds of the psittacine family.

"(b) A person shall not offer for transportation, or transport, in interstate traffic any psittacine bird unless:

"(1) The shipment is destined to a zoological park or research institute, and the shipment is accompanied by a permit from the State health department of the State of destination (where required), or

"The shipment does not exceed two birds, the birds are accompanied by the owner, have been in his possession for the preceding 2 years, have not had contact with other psittacine birds during that period, will be transported immediately to the owner's private residence and retained there as household pets, and are accompanied by a permit from the State health department of the State of destination (where required)."

(d) Violations: Any violation of these Regulations determined by the Director, State Department of Public Health, to constitute a menace to the public health, shall furnish cause for the quarantine of any aviary or pet shop as authorized under Chapter 6, Article 1, Sections 2521, 2522, 2523, and 2524, Health and Safety Code.

Public Health Nursing Responsibility

Teach content included in above sections.

Patient and family should understand that convalescense is often slow and tedious and requires good nursing care.

Advise attendant to watch for relapses and notify physician at once if patient's condition changes.

Teach procedures for:

a. Disposal of nose and throat discharges, disposal of dressings, disposal of uneaten food, care of dishes, care of linen, terminal disinfection.
b. Proper protection of attendant and nurse by wearing gown, mask, and rubber gloves when giving care.

RABIES

Recognition of the disease

An invariably fatal acute encephalitis due to a neurotropic virus acquired from a rabid animal, usually as a result of a bite. Most commonly follows bites around the head. In man it begins with a sense of apprehension, headache, and indefinite sensory changes often referred to location of the bite, and followed in two or three days by beginning paralysis most manifest in muscles of deglutition, resulting in spasm on drinking. Delirium and convulsions follow, terminating in death through respiratory paralysis. In the dog or other animal, recognizable symptoms are any unexplained change in behavior followed by excitability or paralysis, and death within 10 days of onset of symptoms. Verification of cause of death may be established by discovery of Negri bodies in nerve cells of brain or cord, or by animal inoculation.

Etiologic agent

A specific filterable virus.

Source of infection

Infected animals, chiefly dogs; vampire bats in limited areas, notably Trinidad.

Mode of transmission

Usually bites by a rabid animal, occasionally through contact of such animal's saliva with scratch or other break in a person's skin. The milk or meat of infected animals, such as cows, is not dangerous for human use.

Incubation period

Usually two to six weeks. May be prolonged to six months or even longer. Duration depends on extent of laceration, on site of wound in relation to richness of nerve supply, and length of nerve path to brain.

Susceptibility and immunity

Susceptibility general. Natural immunity is not known to exist in man or among the animals subject to the disease. Prophylactic antirabic treatment of infected humans will prevent development of the disease with rare exceptions, if the treatment is begun soon after the injury and the site of the wound is not extensive in the distribution of the facial nerve. Artificial active immunity can be developed in a majority of dogs by antirabic vaccine.

Prevalence

Rare in man. Prevalent on all continents except Australia. More prevalent among dogs and sometimes in wild carnivorous animals.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms, confirmed by the presence of Negri bodies in the brain of the animal which has caused the injury, and by animal inoculations with material from the brain or spinal cord of such animal.

Concurrent disinfection: Of saliva of patient and articles soiled therewith.

Terminal disinfection: None.

Investigation of source of infection: Search for the rabid animal and for any animals bitten by it. Vampire bats may serve as carriers.

General Measures

Detention and examination of dogs suspected of having rabies or those that have bitten a person.

Immediate antirabic treatment of persons bitten by dogs or by other animals suspected or known to have rabies, unless the animal is proved not to be rabid by subsequent observation or by microscopic examination of the brain and cord. The wound caused by any bite of a rabid animal or of an animal suspected of having rabies should immediately be treated to the depths with 20 percent green soap solution, with complete protection of the eyes in the case of face bites.

Education in the care of dogs, especially directed to dog owners and the police, including advice against shooting of rabid or suspected animals in the head lest the laboratory examination of the brain be rendered difficult or impossible. Dogs suspected of being rabid or who have bitten a person should not be killed until observed for a proper period of time or until a clinical diagnosis of rabies has been made.

It should be required that all owned dogs in congested areas be kept on leash at all times when not within the homes of their owners. Ownerless dogs should be destroyed by public authority.

Preventive vaccination of dogs is practicable but cannot be relied upon as the sole means of controlling the disease.

Immunization

The wound or bite should always be cleaned thoroughly with 20 percent green soap and water, allowing the green soap to remain in contact with the wound for at least five minutes. Cauterization with nitric acid is not recommended. (National Research Council—Rabies and Its Control—1946.)

Who should be immunized

Administration of antirabies vaccine will depend upon the following factors:

(a) *Animal known to be rabid by signs and symptoms or by laboratory confirmation:* Clean the wound thoroughly and begin vaccine treatment at once. If lesions are on the face or upper extremity, the patient should receive two doses a day for the first day or two. If bites are on other parts of the body, use standard dosage.

(b) *Animal is not known to be rabid and is held under observation:* If bites are on face or upper extremity and rabies is present in the area, begin treatment as in (a). If bites are on other parts of the body, or no rabies is present in the area, all treatment may be withheld pending outcome of observation of the animal.

(c) *Status of animal is unknown and cannot be determined:* If rabies is known to be present in the area (endemic), proceed as in (a); if rabies is not known in the area or suspected in the animal, vaccine treatment usually can be withheld.

(d) *Exposure to saliva of a rabid animal only, but not bitten:* Adults with abrasions exposed to saliva or children under 12 years with abrasions on exposed surfaces should receive

vaccine treatment. If animal is normal and held under observation, withhold treatment until animal is proved rabid. If animal is suspected as rabid and cannot be found, or the child is under 12 years of age and rabies is present in the area, proceed as in the first part above, (a).

Administration

Immunizing agents: Vaccines made by various processes and proved by mouse protection tests are available from various biological manufacturing companies. The most common product at present is a phenol-treated vaccine but potent ultraviolet irradiated vaccines now are available. Antirabies serum is not yet available but the experimental work is favorable.

Dosage: Daily injections are given for 14 to 28 days unless the gravity of the situation indicates doubling the dosage the first day or two. The decision of the exact number of injections depends upon the location and severity of the bites. It is advisable to follow directions accompanying the vaccine as to the site of injection. The abdomen is the common and usual site but the postaxillary fold is preferred by many.

Reactions

Reactions are not common but may be local or systemic. Paralysis may be transient or prolonged but very rarely fatal. Occurrence is rarely before the twelfth injection.

Laboratory examination "dog heads"

Many specimens for microscopic examination are received in poor condition. Please mail all specimens in ice. Air express is to be preferred.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Animal rabies: Microscopic examination of brain tissue for Negri bodies and confirmatory animal inoculation tests.

Human rabies: Microscopic examination of brain tissue removed at autopsy and confirmatory animal inoculation tests.

Collection of specimens

Animal heads: Do not kill suspected animals unnecessarily. When clinical symptoms of animal are suggestive of rabies, antirabic (Pasteur) treatment of persons bitten or otherwise exposed should be begun at once, not waiting for a laboratory report. Keep suspected animals under observation according to instructions of the local health officer. A rabid animal will usually die within 10 days after the appearance of clinical symptoms. Upon death of the suspected animal remove the head and pack with ice and sawdust or with "dry ice" in metal container with tightly fitting top preferably soldered on and ship by *Railway Express* to the Division of Laboratories.

Human brains: When permission for autopsy has been secured, place brain in watertight container, pack in sawdust and ice in another watertight container and ship by *Railway Express* to the Division of Laboratories.

Interpretation of results

Animal rabies: Positive report: The demonstration of typical Negri bodies in the nerve cells of the brain is considered diagnostic of rabies.

Inconclusive or suspicious report: In some instances it is not possible to demonstrate typical Negri bodies in the brain

tissue but inclusion bodies suggestive of Negri bodies are observed. Under these circumstances the foregoing reports may be given. In all such instances the report will be confirmed by animal inoculation and a final report will be made after suitable observation of the inoculated animals.

Negative report: No Negri bodies could be demonstrated. This report will be confirmed by animal inoculation in all instances where persons or other animals have been bitten by the suspected animal.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Rabies, Human

SECTION 2604. The patient shall be isolated in accordance with Section 2518 during the course of the disease. No restrictions need be placed on contacts of a human case.

Rabies, Animal

SECTION 2606(a). Any animal known to be infected with rabies or suspected of having rabies shall be placed in confinement under proper care and observation and shall not be killed or released until at least 10 days shall have elapsed dating from the beginning of the confinement. If the animal dies, or has been killed under suspicion of having rabies, its head shall be removed and examined in an approved public health laboratory. Case

(b). Animal contacts of known or suspected cases of rabies shall be placed in confinement for a period of at least 90 days before being released from confinement and observation. Contacts

If rabies is known to have become endemic or epidemic within a given area, the local health officer shall establish a quarantine and shall define the boundaries of the endemic area and specify the animals subject to quarantine, and all such animals within the quarantined area shall be kept in strict confinement upon the private premises of the owner, or if taken off the premises of the owner shall be kept under restraint by leash not over five feet in length in charge of a responsible person.

When the health officer establishes such a quarantine, such quarantine shall be for a minimum period of 90 days after the last known case of rabies in the quarantined area. When the boundaries of the quarantined area have been defined, no animals subject to the quarantine shall be removed from the quarantined area during the duration of the quarantine without the written permission of the health officer.

Persons known to have been bitten by rabid animals or suspected rabid animals shall be placed under observation by the health officer and should be encouraged to have proper treatment.

Public Health Nursing Responsibility

Teach content included in above sections.

Emphasize importance of keeping the offending animal alive and isolated for at least 10 days after he has bitten a person.

Ascertain that patient receives prophylactic treatment at the time specified by the physician.

Teach the importance of symptoms to be observed and called to the immediate attention of the physician:

a. Irritation.
b. Pain and numbness at site of wound.
c. Depression.
d. Hypersensitivity.
e. Spasms of throat muscles.

Teach procedures for: Disposal of nose and throat discharges, care of linen, disposal of uneaten food, care of dishes.

RAT-BITE FEVER

(Sodoku)

Recognition of the disease

Usually a history of rat bite within one week or more; primary edematous lesion; swelling of regional lymph nodes; sharp febrile paroxysms alternating with afebrile intervals and accompanied by a rash of broad maculopapules; presence of causative micro-organism in dark-field preparations of blood of white mice, white rats, and guinea pigs inoculated from patient's blood, primary lesion, lymph nodes, or skin macules, or (less frequently successful) in preparations other than blood direct from patient. Caution should be exercised lest the experimental mouse or rat is already naturally infected.

Etiologic agent

Spirillum minus (Spirochaeta morsus-muris).

Source of infection

Usually bite of the rat; rarely cat, weasel, ferret, dog, or bandicoot.

Mode of transmission

During the bite, some of the animal's blood escapes from the injured or diseased buccal mucosa into the wound, or the conjunctival secretion of the rat may contaminate the wound. Blood from an animal in the laboratory may infect man.

Incubation period

Three to 30 days or more; usually one to three weeks.

Communicability

Not transmitted from man to man.

Susceptibility and immunity

No data for man; fatality may reach 10 percent in untreated cases.

Prevalence

Distribution is world wide. Rare in North and South America and in most European countries; more common in Japan and in the Far East.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: Clinical symptoms are more uniformly definite than laboratory confirmation, but the latter should always be attempted with thoroughness. Prompt cure by arsphenamines is of diagnostic value.

Isolation: None.

Concurrent disinfection: None.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Not practicable.

General Measures

Rat surveys and reduction of rat population. Avoidance of rat bites.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Animal inoculation.

Collection of specimens

Collect 5 cc. of whole blood aseptically and send it in a sterile vial. Containers will be supplied on request to the Division of Laboratories.

Interpretation of results

Positive report: Organisms identified following animal inoculation.

Negative report: No Spirilla found.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

RELAPSING FEVER

I. LOUSE-BORNE

Recognition of the disease

Short febrile paroxysms lasting two or three days alternating with afebrile periods of three or four days; general macular eruption; there may be one to 10 relapses; average duration of disease 13 to 16 days. Each attack terminates by crisis. Case fatality rate usually lies between 2 and 5 percent. Diagnosis may be made by dark-field examination of fresh blood or by the intraperitoneal inoculation of white rats with 15 to 25 cc. of patient's blood.

Etiologic agent

A spirochete, *Borrelia recurrentis.*

Source of infection

The natural reservoir of infection is unknown. After biting an infected human being, lice *(Pediculus humanus)* become infective in about 16 days and remain so for life (30 to 40 days). Hereditary transmission in lice through the egg to the larval form is reported but has rarely been observed.

Mode of transmission

Transmission from man to man is effected by crushing an infected louse into the bite wound or into an abrasion on the skin, or by rubbing louse feces or coxal fluid into an abrasion of the skin.

Incubation period

Up to 12 days, the average being seven days.

Communicability

Dependent upon the presence of lice.

Susceptibility and immunity

Susceptibility is general. The duration of immunity after a clinical attack is unknown but it probably does not last more than one or two years.

Prevalence

The disease is prevalent among primitive people who are louse infested. It is found in limited localities in Europe, Asia, North and South Africa, and Central America. For more than a quarter of a century louse-borne relapsing fever has not been observed in the United States.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms with laboratory confirmation.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

General Measures

Reduction of louse infestation through better living conditions, hygiene of person and clothing.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Animal inoculation of whole blood.

Microscopic examination of blood film.

Collection of specimens

Whole blood: During febrile paroxysm collect approximately 5 cc. venous blood aseptically and place in a sterile vial.

Blood films: At the time of collecting whole blood, make blood films as described under malaria.

Submit both whole blood and blood films at the same time. Special containers will be supplied upon request to the Division of Laboratories. Mark the accompanying report slip plainly "For Relapsing Fever."

Interpretation of results

Whole blood: Positive report: Spirochetes resembling *Borrelia recurrentis* demonstrated in blood of inoculated animal. Negative report: No organisms resembling *Borrelia* observed in blood of inoculated animal after two weeks' observation.

Blood films: Positive report: Spirochetes resembling *Borrelia recurrentis* demonstrated in stained blood film. Negative report: No organisms resembling *Borrelia* found on stained blood films.

It is not possible to distinguish between species of *Borrelia* by ordinary laboratory examinations. The presence of any *Borrelia* in the blood is, however, confirmatory of the clinical syndrome of relapsing fever. Specimens taken during afebrile period are likely to yield negative results.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2608. No restrictions on case or contacts. Reportable only.

II. TICK-BORNE

Recognition of the disease

Clinical course similar to that of louse-borne infection. There are usually two or three febrile attacks from two to 10 days' duration, with intervals between attacks varying from two to 12 days. Diagnosis is made by demonstrating the presence of the causative micro-organism in dark-field preparations or stained films from patient's blood taken at the height of a febrile paroxysm, or from blood of white mice, white rats, or monkeys inoculated with patient's blood at that time.

Etiologic agent

A spirochete, *Borrelia duttoni.*

Source of infection

Primarily an infection of wild rodents, transmitted by the genus of ticks *Ornithodorus.* In the United States *O. turicata* is a known vector in Texas and Kansas; *O. hermsi* in California, Colorado, and Idaho. *O. talaje* is a vector in Panama, Central and South America, while *O. moubata* is the vector in tropical Africa.

Mode of transmission

Man is accidentally infected by a tick bite.

Incubation period

Three to six days, but may sometimes be as short as two, or as long as 12 days.

Communicability

Not communicable from man to man.

Susceptibility and immunity

Susceptibility is general. The duration of immunity after recovery is indefinite, but probably does not last more than one or two years.

Prevalence

Widespread throughout tropical Africa. Foci have been observed in Spain, North Africa, Arabia, Iran, India, and other parts of Central Asia, as well as in North and South America. In the United States human cases of tick-borne relapsing fever

have been found to originate in limited localities of 11 different states.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms with laboratory confirmation.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Important.

General Measures

Avoidance of tick-infested caves, camp sites, shacks, and ground areas. The ticks live in the soil and rodent nests and bite during the night or in darkness. They can live for years without feeding and remain infective. Trans-ovarian passage of the spirochete occurs in 3 percent of ticks. Exposed persons should use a tick repellent on socks and trousers. DDT affects the young larvae and adult male.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

See Louse-borne Relapsing Fever.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Section 2608. No restrictions on case or contacts. Reportable only.

Public Health Nursing Responsibility

Teach content included in above sections.

RHEUMATIC FEVER

(Acute Rheumatic Fever, Acute Rheumatism)

Recognition of the disease

The manifestations of rheumatic fever are protean. They appear following recovery from hemolytic streptococcal upper respiratory tract infections and without such prior infections having been recognized.

Typical attack: The distinguishing characteristics of a typical attack are fever and joint or muscle pains. Migratory polyarthritis, carditis, and chorea form the classical clinical triad. There is frequently a history of a recently preceding upper respiratory tract infection (e.g., tonsillitis, nasopharyngitis, scarlet fever, or ill-defined respiratory infection). The blood sedimentation rate and the leucocyte count usually show a marked elevation.

Atypical attack: Rheumatic fever may be insidious in its onset. Suggestive manifestations are epistaxis, muscle pains, multiform erythema or purpura, tachycardia, slight elevation of body temperature, pallor, anorexia, and, in children, failure to gain weight. The evanescent character of these symptoms, if accompanied by an elevation of the blood sedimentation rate, is a helpful diagnostic criterion.

Etiologic agent

Unknown. The upper respiratory tract infection which often precedes rheumatic fever is caused by Lancefield's group A hemolytic streptococcus. Rheumatic lesions have not been found to contain an infecting organism; they resemble sensitization phenomena and are believed to be induced by a product of hemolytic streptococcal infection.

Source of infection

Unknown.

Mode of transmission

Unknown.

Incubation period

Unknown. There is an asymptomatic period, varying from several days to about four weeks, between an acute hemolytic streptococcal respiratory infection and the onset of rheumatic manifestations.

Period of communicability

Rheumatic fever is not communicable. The preceding streptococcal infection which precipitates rheumatic fever and which is communicable has usually subsided at the time that rheumatic fever manifests itself.

Susceptibility and immunity

Unknown. There seems to be some familial or genetic factor of susceptibility. The natural tendency of this disease is to recur; there is no evidence that immunity is developed.

Prevalence

There is a close parallelism between the prevalence of rheumatic fever and the prevalence of recognized streptococcal respiratory tract infections. In the United States rheumatic fever is most prevalent in the Rocky Mountain region and in the New England and North and Central Atlantic states. The lowest incidence of rheumatic fever occurs in the South and Southwest. The curve of seasonal incidence follows that of streptococcal infections, reaching its peak during the spring months and its low point during the summer and early autumn.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: On the basis of clinical examination.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: None.

Penicillin prophylaxis: Individuals who are known to have had prior attacks of rheumatic fever and who are free from active disease are less likely to develop streptococcal throat infections during the winter and spring months if treated during this time of year with penicillin administered under continuing medical supervision in the appropriate prophylactic dosage. Sulfonamide prophylaxis is ineffective following the onset of a streptococcal infection and is contra-indicated for the active case of rheumatic fever.

General Measures

Careful medical examination of children with vague symptoms, e.g., malaise, pallor, failure to gain weight, epistaxis, and transient aches and pains; appropriate laboratory tests should be included.

Emphasis on the fact that rheumatic activity may begin insidiously and may cause incapacitating heart disease.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

No laboratory services available.

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SECTION 2610. No restrictions on case or contacts. Reportable only.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach importance of medical care when above named vague and early symptoms appear. Other early symptoms to observe include:

a. Swelling of joints.
b. Personality changes.
c. Profuse diaphoresis.
d. Slight elevations of temperature.

During patient's long convalescence, help family to:

a. Understand personality adjustments necessary to make living as normal as possible.
b. Provide occupational therapy suitable to patient's interests and physical ability.
c. Avoid fatigue of the patient by use of:
    1. Flat, comfortable bed.
    2. Cradle over extremities.
    3. Foot board, back and arm rest.
d. Understand physician's recommendations regarding removal of foci of infection.

RICKETTSIAL DISEASES

(The Typhus Group of Fevers)

I. TYPHUS

A. EPIDEMIC OR CLASSICAL TYPHUS (LOUSE-BORNE)

Recognition of the disease

The onset is variable, often being sudden and marked by headache, chills, fever, and general pains, and a macular eruption on the fifth or sixth day, toxemia, and a quite definite course terminating in rapid lysis after about two weeks of fever. Case fatality varies from 10 to 40 percent in different epidemics and with age selection. Very mild infections may occur in which the eruption is evanescent or absent, especially in vaccinated persons. The Weil-Felix reaction is positive with Proteus OX_{19} in most cases, if serum is obtained after the tenth day. Complement fixation test becomes positive about the same time.

Etiologic agent

Rickettsia prowazeki, var. *prowazeki.*

Source of infection

Infected persons.

Mode of transmission

The infectious agent is transmitted from man to man by lice *(Pediculus humanus)* which have fed upon infected persons. The rickettsias are inoculated by crushing the infected lice or scratching louse feces into the wound made by the bite or into other superficial skin abrasions. Dirty clothing contaminated with louse feces may be the source of infection transmitted through the air to the respiratory tract.

Incubation period

From six to 15 days, commonly 12 days.

Period of communicability

During the febrile illness and possibly for two or three days after the temperature returns to normal the patient is infective for lice.

Susceptibility and immunity

Susceptibility is general. One attack confers immunity, which is not always permanent.

Prevalence

Widely distributed among people living under crowded and unhygienic conditions. Cases occur throughout the year with seasonal increase during the colder months.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting.

Concurrent disinfection: Use of insecticide powders (DDT) on clothing and bedding of patient and contacts, and special treatment of hair for louse eggs (nits) according to special directions.*

Terminal disinfection: None.

Investigation of source of infection: Every effort should be made to trace the source of infection to direct or indirect contact with a preceding case of the disease.

General Measures

Promotion of better living conditions, more frequent bathing and laundering, reduction in louse infestation.

* See Part III, Appendix, for discussion of use of DDT in disinfestation.

Epidemic Measures

Organized and systematic delousing, and vaccination of population groups, centering about households of infected persons.

Immunization

Commercial vaccines of various types have been prepared. In the United States a vaccine is prepared by growing rickettsias in the yolk sac of the developing chick embryo. The resulting suspension after purification is inactivated by formalin. This vaccine (Cox type) is administered in two doses and confers considerable protection. The length of time for which it may be expected to give full protection is not known. Reimmunization with a single dose should be given every few months where the danger of typhus is present. In vaccinated persons, the risk of infection is reduced, the course of the disease modified, and the case fatality rate lowered.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination test (Weil-Felix reaction).
Complement-fixation tests.

Collection of specimens

Collect approximately 5 cc. venous blood aseptically as soon after onset as possible and again 12-14 days after onset. Place in a sterile vial. Special containers will be supplied upon request to the Division of Laboratories, or the standard containers used for the Wasserman or typhoid agglutination tests may be used. Mark accompanying report slip plainly "For Typhus Fever."

Interpretation of results

Agglutination test (Weil-Felix reaction): Positive report: Indicated by a rise in titer or a high (1-320 or 1-640) titer to Proteus OX_{19} in a single specimen. Negative report: No agglutination or only in low titer only.

Weak or moderate results by the Weil-Felix test are of little diagnostic significance unless confirmed by a sharply rising titer during the third week of the disease; repeated specimens are, therefore, advisable. Non-specific reactions are obtained in Tularemia, Brucellosis, pregnancy, and toxoplasmosis.

Complement-fixation test: Positive report: Indicates four plus (complete fixation) in serum dilution 1-6 or higher. Weakly positive report: Indicates two plus or three plus (incomplete fixation) in serum dilution 1-6 or higher. Negative report: No reaction (no fixation of complement) or fixation less than two plus in serum dilution 1-6.

Weakly positive or negative results should not be considered conclusive—later specimens should be submitted for confirmation of results.

Positive complement-fixation is confirmatory of clinical findings.

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Case

SECTION 2632. (a) The health officer shall communicate immediately with the Director of the State Department of Public Health. The patient shall be kept in a vermin free room and all lice and louse eggs on the clothing or in the hair of the patient shall be destroyed. The period of isolation shall terminate at the time of clinical recovery of the patient.

Contacts

(b) Shall be vermin free and be kept in quarantine for 14 days after last exposure.

B. ENDEMIC OR MURINE TYPHUS (FLEA-BORNE)

Recognition of the disease

Clinical course similar to that of epidemic type except that the disease tends to be milder. Case fatality rate for all ages is about 2 percent, with prognosis grave in old people. Weil-Felix reaction becomes positive with Proteus OX_{19} after the ninth day in most cases. Complement fixation reaction becomes positive about the same time.

Etiologic agent

Rickettsia prowazeki, var. *mooseri.*

Source of infection

Infected rodents, especially *Rattus rattus norvegicus.*

Mode of transmission

The agent is transmitted from rodent to man by a flea, commonly *Xenopsylla cheopis.*

Incubation period

From 6 to 14 days, most often 12 days.

Susceptibility and immunity

Susceptibility is general. One attack confers immunity, which is not always permanent.

Prevalence

Widely distributed in temperate, semitropical, and tropical areas. Transmission to man occurs throughout the year, with seasonal increase during the warmer months.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting.

Terminal disinfection: None.

Investigation of source of infection: Rodents about place of occupation or home.

Rodent control: In and about the premises where the patient was infected.

General Measures

Rodent control.

Immunization

A vaccine made from rickettsias grown on egg yolk sac of developing chick embryo which have been killed with formalin is now available. Three doses at seven-day intervals, subcutaneously, are advised. Immunity is said to be active up to six months. "Booster" doses, if given after six months, require 2 (1.0 cc.) injections 7 to 10 days apart.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

See section on Epidemic Typhus.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2630. The patient shall be isolated in accordance with Section 2518 in a vermin free room until clinically recovered. If the premises where the patient resides is vermin free and fleas are not present, no control need be exercised over contacts.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach symptoms of complicating illnesses which occasionally occur: Pneumonia and gangrene of the skin.

II. ROCKY MOUNTAIN SPOTTED FEVER

(Tick-Borne)

Recognition of the disease

Sudden onset with fever, headache, photophobia, muscle and joint pains, and chills. Appearance of the characteristic maculopapular rash, usually first on the extremities (third or fourth day of fever) and rapidly spreading to involve most of the body. History of either a tick bite or exposure to ticks. The case fatality rate varies with age and locality. In the United States, for all ages it is approximately 20 percent. Toward the end of the second week the Weil-Felix reaction may become positive with Proteus OX_{19} and frequently with OX_2. The complement fixation test also becomes positive at this time.

Etiologic agent

Rickettsia rickettsi.

Source of infection

Infected ticks. In the eastern and southern United States the common vector is the dog tick, *Dermacentor variabilis;* in the northwestern United States, it is the wood tick, *Dermacentor andersoni;* in the southwestern United States it may occasionally be the lone star tick, *Amblyomma americanum.* In Brazil, *Amblyomma cajennense* is the common vector. The rabbit tick *(Haemaphysalis leporis palustris)* has been found naturally infected, but this species does not bite man. The infection is passed from generation to generation in ticks and is probably maintained by infected and noninfected larvae feeding upon susceptible wild rodents.

Mode of transmission

Bite of tick or contact with tick material such as its blood or feces on the unbroken skin.

Incubation period

From three to about ten days.

Period of communicability

Not communicable from man.

Susceptibility and immunity

Susceptibility general. One attack confers immunity which may or may not be permanent.

Prevalence

Known to occur throughout North America and in several areas of South America. The season of occurrence is predominantly in the spring and early summer, corresponding to the appearance of adult ticks.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: All cases of the disease should be reported to the health authorities.

Concurrent disinfection: All ticks on the patient should be destroyed.

Terminal disinfection: None.

Investigation of source of infection: Determination of areas where there are infected ticks should be attempted wherever practicable.

General Measures

Personal prophylaxis by avoidance of tick-infested areas when feasible, by careful removal of ticks from the person as promptly as possible, without crushing, and by protection of the hands when removing ticks from animals.

The destruction of ticks by clearing and burning vegetation, and the destruction of small mammalian hosts of ticks in infected zones have been suggested. There is little evidence, however, that much has been accomplished in limiting the disease by such methods.

Immunization

Who should be immunized

Immunization is recommended only for those persons whose activities might expose them to infection in a known tick-infested area. The vaccine produces an immunity for only one tick season, and to be continuously effective must be repeated before each tick season.

Administration

Immunizing agents and dosage: A vaccine made from ticks is prepared by the United States Public Health Service at Hamilton, Montana. A second method of preparing the vaccine utilized the rickettsias grown in the yolk sac of the developing chick embryo.

Animal experiments indicate that the yolk sac and tick vaccines are of comparable value in prevention. Vaccination appreciably lessens the chance of infection and lowers the case fatality rate. The vaccine is of no value after the infection has been acquired, nor is it of value in treatment.

Tick vaccine (available only from United States Public Health Service) should be administered in three doses of 1.0 cc., each, given subcutaneously, at intervals of one week.

Chick embryo vaccine (available commercially) should be administered in three doses of 1.0 cc., each, given subcutaneously, at intervals of one week.

Reactions

Mild local reactions may occur.

Treatment

Hyperimmune rabbit serum is available from the U. S. Public Health Service Laboratory in Montana and certain commercial companies for treatment. In experimental animals it will affect favorably the course of the disease if it is administered at the time of the appearance of symptoms or shortly thereafter. Its use in human beings is justified if it can be administered before or about the time of initial appearance of the eruption. Para-aminobenzoic acid has been reported to influence the course of the illness.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination test (Weil-Felix reaction).
Complement-fixation test.

Collection of specimens

Collect approximately 5 cc. venous blood aseptically as soon after onset as possible and again 12-14 days after onset. Place in a sterile vial. Special containers will be supplied upon request to the Division of Laboratories, or the standard containers used for Wassermann or typhoid agglutination test may be used. Mark accompanying report slip plainly "For Rocky Mountain Spotted Fever." A 5 cc. blood sample will yield sufficient serum for both agglutination and complement-fixation tests.

Interpretation of results

Agglutination test: Positive report: Indicated by a rise in titer or a high titer (1-320 or 1-640) in a single specimen to OX_{19} and OX_2. Negative report: No agglutination or in low titer.

Weak or moderate results by the Weil-Felix tests are of little diagnostic significance unless confirmed by a sharply rising titer during the third week of the disease; repeated specimens are, therefore, advisable.

Complement fixation: Positive complement fixation tests are confirmatory of clinical findings and are specific for type of infection present. The reaction is usually negative until the 14th day after onset. In case of negative results, repeated specimens are recommended.

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SECTION 2612. No restrictions on case or contacts. Reportable only.

Public Health Nursing Responsibility

Teach content included in above sections.

III. TSUTSUGAMUSHI DISEASE OR "SCRUB TYPHUS"

(Mite-Borne)

Recognition of the disease

Sudden onset with malaise, chilliness, fever, and headache which may increase in intensity. A small necrotic ulcer, called the "eschar" or primary lesion, is usually seen at the former site of attachment of the infected mite. A characteristic dull red maculopapular eruption appears on the trunk from the fifth to the eighth day, may extend to the arms and legs, and ordinarily fades within several days, but may be evanescent. Cough and physical signs of pneumonitis are frequently present. In uncomplicated cases convalescence is established in two to three weeks. Case fatality varies with age and locality. Among healthy males of military age it averages about 6 percent in patients in hospitals. The Weil-Felix reaction becomes positive with Proteus OXK by the end of the second week. It is usually negative with OX_{19} and OX_2.

Etiologic agent

Rickettsia orientalis.

Source of infection

Infected larval mites of *Trombicula akamushi* and related species varying with locality. The nymph and adult are free-living. The infection is passed from generation to generation and maintained by feeding upon susceptible wild rodents, particularly mice and rats of different species, varying with locality.

Mode of transmission

By the bite of infected mites.

Incubation period

Average about seven to 10 days, may be as long as 14 days.

Period of communicability

Not communicable from man to man.

Susceptibility

Susceptibility is general. One attack confers immunity, which is not always permanent.

Prevalence

Limited localities in countries of southeastern Asia, particularly India, Burma, Federated Malay States, and French Indo-China; in the island archipelagoes of the west and south Pacific, Japan, Formosa, Sumatra, Java, New Guinea, and in North Queensland, Australia. Near the Equator transmission may occur throughout the year; in Japan it is limited to the summer months.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease.
Isolation: Unnecessary.
Terminal disinfection: None.
Quarantine: None.
Immunization: None.
Investigation of source of infection: None.

General Measures

Locations which are to be used as new camp sites should be prepared as fully as possible before the arrival of a new unit, employing native labor whenever it is available. All grass and scrub should be cut level with the ground, and, after drying, collected and burned or hauled away. It is highly desirable to burn over the camp area with a power oil sprayer or flame thrower. Underbrush in adjacent jungle strips should be cleared out in a similar manner and ground animals killed.

Sleeping on the ground should be avoided. When practicable cots or other structures should be provided to keep the bedding from contact with the ground.

At the earliest time after exposure, bathing with thorough soaping and scrubbing of the skin with a rough cloth.

Impregnation of clothes with antimite fluids and powders will serve as a satisfactory method of individual control. Such measures are particularly applicable to personnel working in known endemic foci.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination test (Weil-Felix reaction).
Complement-fixation tests.

Collection of specimens

Collect approximately 5 cc. venous blood aseptically as soon after onset as possible and again 12-14 days after onset. Place

in a sterile vial. Special containers will be supplied upon request to the Division of Laboratories, or the standard containers used for the Wassermann or typhoid agglutination tests may be used. Mark accompanying report slip plainly "For Typhus Fever."

Interpretation of results

Agglutination test: Positive report: Rise in titer or a high titer (1-320 or 1-640) to Proteus OXK.

Negative report: No agglutination or in low titer only.

Weak or moderate results by the Weil-Felix test are of little value unless confirmed by a sharply rising titer during the third week of the disease; repeated specimens are, therefore, advisable.

Complement fixation: Positive complement fixation tests are confirmatory of clinical findings and are specific for the type of infection present. The reaction may be negative until the 14th day after onset. In case of negative results repeated specimens are recommended.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

IV. OTHER RICKETTSIAL DISEASES

There are other diseases either proved to be caused or probably caused by one of the rickettsial agents. Q fever is caused by *Coxiella burneti (Rickettsia diaporico)* which has been isolated from several species of ticks in Australia and the United States. Infections with this organism have been described as occurring in abattoir workers in Australia, and a laboratory outbreak characterized by atypical pneumonia was described in the United States. In 1947 the disease was found in Southern California and *R. burneti* isolated from raw milk.

Boutonneuse fever, a disease caused by *Rickettsia conori* and related to Rocky Mountain spotted fever, has extensive distribution in Rumania, Portugal, and the countries bordering the Mediterranean. It is also called Marseilles fever, *fievre exanthematique, fievre escarronodulaire.* Kenya typhus and South African tick fever may be closely related to boutonneuse fever. The dog apparently is an important reservoir.

The exact position of several of the so-called rickettsial diseases, such as "Indian tick typhus," is not clear. Others, such as "trench fever," are not actually known to be rickettsial in origin.

RINGWORM (DERMATOPHYTOSIS)

I. RINGWORM OF THE SCALP

(Tinea Capitis)

Recognition of the disease

Inspection of the scalp for localized round, scaly patches with short, broken-off hairs. The fungus may be demonstrated in infected hairs or skin scales, and the type of fungus should be confirmed by culture. Examination under suitably filtered ultraviolet light to detect characteristic fluorescence. Identification of the species of fungus may be important in determining treatment.

Etiologic agent

Microsporon audouini, M. canis (lanosum or *felineum)* and other species of fungi cause sporadic tinea capitis.

Source of infection

Lesions on scalps of infected persons; articles of clothing, especially hats and caps containing the fungus or its spores, or infected hairs or scales shed by individuals. In the case of infection with *M. canis* or other animal fungi, contact with lesions or hair shed by young cats or dogs affected with ringworm.

Mode of transmission

Directly from person to person by contact with lesions of infected persons (or, in the case of animal fungi, with infected animals). Possibly indirectly by articles of wearing apparel or by surfaces contaminated with scales or hairs from lesions. Transmission occurs in the home and in schools, especially during games in which personal contact is close.

Incubation period

Undetermined.

Period of communicability

As long as the fungus or its spores can be found at the site of the lesions.

Susceptibility and immunity

Susceptibility in childhood universal. Reinfection is common and there is no immunity after cure. *M. audouini* infection very rare after puberty; adults as well as children susceptible to *M. canis.*

Prevalence

Widespread, especially in school and institution outbreaks.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: All cases recognized on inspection of school children or on survey by means of suitably filtered ultraviolet light should be reported to the school authorities.

Isolation: Infected children should be excluded from school until recovery. In many cases this may require months. In institutions, infected children should be separated from healthy children.

Concurrent disinfection: Use of stocking cap or other type of inexpensive head covering and destruction of such articles by burning after use.

Terminal disinfection: None.

Quarantine: None, but all children under 15 in the household or institution group should be examined with suitably filtered ultraviolet light at regular intervals until the source case is completely cured.

Immunization: None.

Investigation of source of infection: Upon the discovery of a clinical case of ringworm of the scalp, all school children in the classroom should be inspected and in addition surveyed with suitably filtered ultraviolet light. Any child showing evidence of the disease should be immediately excluded from school. Resurvey of classes for evidence of infection should be repeated until one month after the last case is detected. Should the condition exist in two or more classrooms in a school, or be prevalent in more than 2 percent of a single classroom, the entire population of the school under 15 years of age should be screened by means of suitably filtered ultraviolet light. Animal pets, such as cats and dogs, should likewise be examined as possible sources of infection.

General Measures

Cleanliness of hair and scalp.

Prompt and persistent treatment of infection. In the case of infections with *Microsporon audouini,* X-ray epilation followed by fungicide treatment is the method of choice. This results in the most rapid cure and least loss of school time. Precautions should be taken to prevent reinfection after X-ray treatment.

Education of parents and school authorities in methods of spread of the disease and measures for control.

Provision for individual storage of clothing in school.

Provision for separate, isolated classrooms for education of children with the condition may be found necessary. These should be so set up that children awaiting final decision as to freedom from infection may not be reinfected.

Laboratory Diagnosis

See ringworm of the body.

Services available

II. RINGWORM OF THE BODY

(Including Groin and Feet)

Inspection of the body for characteristics of the local lesion. Demonstration of the fungus in skin scales from the edges of the lesions. Identification of the species of fungus may be important in determining treatment.

Recognition of the disease

Several species of fungi pathogenic to the skin.

Etiologic agent

Lesions on bodies of infected persons, articles of clothing carrying the fungus or its spores, or infected hairs or scales.

Source of infection

Directly by skin-to-skin contact with lesions of infected persons; possibly indirectly by articles of wearing apparel or towels or surfaces contaminated with scales or hair from lesions.

Mode of transmission

Undetermined.

Incubation period

As long as the fungus or its spores can be found on the lesions. Transmission may occur readily in home contacts or in recreational pursuits, particularly those carried out indoors.

Period of communicability

There is general susceptibility to ringworm infections of the body.

Susceptibility and immunity

Prevalence Widespread, varying with conditions of crowding and during periods of warm weather.

Method of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: All cases of ringworm on exposed parts of the body in school children should be reported to the school authorities.

Isolation: Children with ringworm of the exposed parts of the body should be excluded from school until under treatment. Children and adults with marked cases of the disease should be excluded from privileges in gymnasium and at swimming pools. This does not apply to those with ringworm of the feet, inasmuch as there are too many carriers of this condition to make control practicable.

Concurrent disinfection: Cleanliness of body and underclothing. Cotton socks should be used and boiled after each use, in the case of infection of the feet. Shoes may be exposed to formaldehyde vapor or other disinfectants with proper precautions.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Among school children, routine inspection to detect unreported cases.

General Measures

Cleanliness of body and underclothing.

Thorough drying between toes after bathing.

Prompt and persistent treatment of lesions.

Protection of feet against contamination by use of sandals in showers and dressing rooms and areas used by people with bare feet.

Wearing of properly fitted and ventilated shoes.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available Microscopic and cultural examinations of hairs and skin scales from affected areas.

Collection of specimens Collect hairs, preferrably hair stumps or scales from skin in a small clean envelope or in bottle provided with standard tuberculosis mailing outfit. Mark accompanying report slip plainly *"For Fungi Ringworm Suspected."*

Interpretation of results Positive: If microscopic and cultural examination of specimen shows presence of one or the other of the dermatophyte species.

Negative: No organism resembling the dermatophyte species observed microscopically or obtained upon culture or specimen submitted.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

SANDFLY (Phlebotomus or Pappataci) FEVER

Recognition of the disease

A short (three or four day) fever with a clinical picture not unlike influenza except that evidences of inflammation of the respiratory tract are absent in sandfly fever. Headache, fever of 38.3 to 38.9 degrees C. (101 to 102 degrees F.), pain back of the eyes and on motion of the eyes, injected sclerae, malaise, and pain in the limbs and back are characteristic symptoms and signs. There is no clinical or laboratory diagnostic test. Leucopenia, most prominent on the fourth or fifth day after the onset of the fever, is usually present.

Etiologic agent

A specific filterable virus.

Source of infection

The blood of an infected person.

Mode of transmission

The vector is a small, hairy, blood-sucking midge, *Phlebotomus papatasii*, which does most of its biting at night. It is possible that other species of Phlebotomus may also carry the virus.

Incubation period

Up to six days, averaging three to four days, rarely if ever less than two and one-half days.

Period of communicability

The virus is present in the blood of an infected person at least 24 hours before and after the onset of fever.

Susceptibility and immunity

Susceptibility is apparently universal. Acquired immunity is usually lasting. Immunity of native populations in sandfly areas is probably attributed to infection early in life.

Prevalence

Occurs only in those parts of Europe, Africa, and Asia where vector exists. In this respect it is a disease of subtropical and tropical areas where there are long periods of hot, dry weather, but in general it is to be found in a belt extending around the Mediterranean Sea eastward into Burma and China. It is seasonal, occurring between the months of April and October, and particularly prone to appear as a disease in troops which come from nonendemic areas and are quartered in the endemic zone during the spring and summer.

Methods of control

Personal: The use of an insect repellent carefully applied each evening to the exposed parts of the body.

Environmental: The small size of *Phlebotomus papatasii* allows it to pass freely through ordinary mosquito netting, thus requiring the use of bed nets of 25 to 30 meshes per inch, which should be sprayed with insecticide before entering. Some control can be effected with nightly spraying of the screens with an insect repellent and DDT.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

SCABIES

(The Itch)

Recognition of the disease Observation of the characteristic burrows of the itch mite in the webs of the hand. Its identification under a lens, or of the eggs scraped from the burrows, may be positive in skilled hands.

Etiologic agent *Sarcoptes scabiei,* the itch mite.

Source of infection Persons harboring the itch mite on their skin in burrows, particularly between the fingers.

Mode of transmission Direct contact with infested person and indirectly by use of underclothing, gloves, bedding, etc., of such persons.

Incubation period Merely the length of time for the itch mite to burrow under the skin and lay eggs. The itching and scratching may occur within 24 to 48 hours of original infestation.

Period of communicability Until the itch mites and the eggs are destroyed.

Susceptibility and immunity These terms are not appropriate to this condition. Anyone may become infested or reinfested.

Prevalence Widespread and occurring sporadically and in epidemics, under conditions of crowding, body uncleanliness, neglect, and lack of soap and water.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: The condition should be reported to the school authorities if discovered in school children.

Isolation: Children should be excluded from school until adequately treated by painting of body with benzyl-benzoate emulsion.*

Concurrent disinfection: Desirable but not necessary if treatment with benzyl-benzoate emulsion has been carried out.*

Terminal disinfestation: Desirable but not necessary if treatment with benzyl-benzoate emulsion has been carried out.*

Quarantine: None.

Investigation of source of infestation: Search for unreported or unrecognized cases in companions or house or family mates of the infested individual.

General Measures

Cleanliness of body and underclothing and bed covering especially.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available No regular laboratory services available. Consult the Division of Laboratories regarding the submission of specimens.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

* See Part III, Appendix, for discussion of use of DDT in disinfestation.

SCHISTOSOMIASIS

Recognition of the disease

History of skin contact with water known to contain the infected intermediate host followed by itching spots on the skin as the water dries. A few weeks later there is evidence of colitis or cystitis manifested by dysentery and hematuria, respectively, accompanied by leucocytosis and eosinophilia. This stage progresses and becomes complicated by cirrhosis and splenomegaly with ascites. Finding the ova in the stools or urine confirms the diagnosis. Massive larval infection may cause acute prostration and high fever.

Etiologic agent

Three species of schistosomes mature in man. *Schistosoma mansoni* in Central America, the West Indies, northern South America and Africa, *Schistosoma haematobium* in Africa and *Schistosoma japonica* in the Orient. The ova of these three flukes are spined and are deposited into the abdominal venules from which they work their way to the mucosa of the bowel or bladder. None of these flukes is indigenous to the continental United States but they are found in Puerto Rico and the Philippines. The larvae of some other schistosomes found in the United States may cause "swimmer's itch" by penetrating the human skin. These schistosomes do not infect man; the larvae die in the skin.

Source of infection

Waters containing the intermediary snail host, contaminated by human excrement containing the ova of the parasite.

Mode of transmission

Ova hatch in the water and enter the snail host. In the snail multiplication occurs and swimming larval forms called "cercariae" develop which leave the snail and, upon contact with the human skin, penetrate it to gain access to the blood stream.

Incubation period

A dermatitis may or may not occur at the time of penetration of the cercariae. An interval of at least one month, usually three, elapses after infection before the ova are found in the stools or in the urine.

Period of communicability

As long as the ova are discharged in the urine or stools of infected persons, and as long as the cercariae are to be found in sewage polluted water. The ova hatch into free-swimming forms that are infectious only for the snail; cercariae are short-lived but infected snails give off cercariae for several months.

Susceptibility and immunity

Susceptibility is general. Increased resistance may develop as a result of infection.

Prevalence

No indigenous cases in the continental United States. Occurs in areas of the West Indies and northern South America; common in the Orient and Africa.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease by symptomatology and microscopic examination of the stools or urine for ova.

Isolation: None.

Concurrent disinfection: Sanitary disposal of feces and urine.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Important; examination of local waters for infected snails followed by a vigorous campaign to eliminate sources of pollution and snails from these waters.

General Measures

Regulation of disposal of sewage.

Treatment of the infected persons by sodium antimony tartarate, fouadin, or other trivalent antimony compounds.

Education of people in endemic areas regarding method of transmission. People should be warned not to bathe in contaminated streams and persons whose occupations require them to wade in contaminated waters should be cautioned and provided with suitable waterproof garments.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available Microscopic examination of feces and urine for identification of ova.

Collection of specimens Feces: Collect portions of stool and place in bottle provided in standard mailing outfit for Amoebic Dysentery.

Urine: Collect specimen and submit a portion in bottle provided in standard mailing outfit for Amoebic Dysentery.

Mark accompanying report slips plainly *For Schistosomes.*

Interpretation of results Positive: Ova present and identified as species of *Schistosoma.*

Negative: No ova found in specimens submitted.

It is generally possible to identify the species of *Schistosoma* by study of the ova. The ova of *Schistosoma haematobium* are usually found in the urine only.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

SMALLPOX

(Variola)

Recognition of the disease

One to five days of febrile symptoms precede the true or focal eruption, which is papular for one to four days, vesicular for one to four days, and pustular for two to six days, forming crusts which fall off 10 to 40 days after the first sign of the lesion and leave pink scars which fade gradually. Unless scanty, the eruption is symmetrical and general, more profuse on prominences, extensor surfaces, and surfaces exposed to irritation, than on protected surfaces, flexures, and depressions. Most abundant and earliest on the face, next on forearms, wrists, and hands, favoring the limbs, especially distally, more than the trunk. More abundant on shoulders and chest than on loins or abdomen, but the lesions may be so few as to be overlooked. Typical isolated lesions are round and deep seated and have an infiltrated base, except when modified naturally or by previous vaccination. Subclinical cases exhibiting fever but no eruption have been reported but must be rare. Any case of purpura or hemorrhage into the skin with fever should be treated with smallpox precautions until another diagnosis is clear. Smallpox varies in severity from mild strains with fatality rate under 1 percent to severe strains with about 30 percent fatality; in recent years the disease has centered about these two extremes, breeding true to type as regards severity. In Great Britain the mild type is called variola minor and the severe type variola major. The lesions in the mild type tend to be more superficial, and with less hemorrhagic tendency than in the severe, though occasional severe cases occur in outbreaks due to mild strains, and mild cases in outbreaks due to severe strains, even independently of the vaccinal status of the individual.

Etiologic agent

A specific filterable virus.

Source of infection

Lesions of the mucous membranes and skin of infected persons.

Mode of transmission

By contact with persons sick with the disease; this contact need not be intimate, but aerial transmission except for short distances appears to be unlikely. By articles or persons freshly contaminated by discharges of the sick.

Incubation period

Seven to 16 days, commonly 10 days. Cases with incubation period of 21 days have been reported. The milder types tend to have longer incubation periods.

Period of communicability

From first symptoms to disappearance of all scabs and crusts. Most communicable in the early stages of the disease.

Susceptibility and immunity

Susceptibility universal, but not every exposure of a susceptible person results in the disease. Acquired permanent immunity usually follows recovery from an attack of the disease. Second attacks are rare. Artificial immunity by vaccination is commonly complete for 5 to 20 years, but susceptibility often recurs after five years. A higher degree of vaccinal immunity both in the community and in the individual, is required to protect against severe strains than against mild.

Prevalence

Distribution in sporadic or epidemic form; varies widely according to the immunity status of the population of an area

and its exposure to infection from without. Occurrence is most frequent in the winter and least in summer months. There is no regional or climatic limitation to its prevalence, except as population groups are more or less well protected by vaccination or by non-exposure to the disease.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms. The rapidly fatal or fulminating type and the very mild type may escape diagnosis until secondary cases appear.

Concurrent disinfection: No article to leave the surroundings of the patient without boiling or equally effective disinfection.

Terminal disinfection: Thorough cleaning and disinfection of premises.

Investigation of source of infection: The immediate prior case should be sought industriously, and cases of unreported chickenpox associated in time or place carefully reviewed for error of diagnosis. Active cases of the disease without remaining constitutional symptoms must be sought, also persons recently in contact with cases, and exposed vaccinated persons who may have developed unrecognized forms of the disease, and thus be serving as sources of infection.

Immunization

Who should be immunized

All persons should be successfully vaccinated routinely, preferably in early infancy, and revaccinated before entering school. Two successful vaccinations several years apart, will produce relatively good immunity except in virulent outbreaks. The entire population should be revaccinated when the disease appears in virulent form. Unless smallpox exists in the community in virulent form, the vaccination of certain persons, such as infants with severe eczema, may be deferred temporarily but should be done as soon as the skin has cleared. Unless this is done, such infants may acquire generalized vaccinia from contact with newly vaccinated members of the family. During the presence of virulent smallpox, there are no exceptions.

Administration

Immunizing agent and its preservation: Glycerinated calf lymph vaccine virus either with or without brilliant green should be employed. Do not use an out-dated vaccine. Smallpox vaccine must be kept on *ice or preferably in the freezing compartment* of a mechanical refrigerator. Remove only the amount that can be used within a few hours. Never return to the refrigerator smallpox vaccine which has remained for any length of time at room temperature. When it is necessary to take smallpox vaccine into the field in warm weather, arrange to carry what is needed packed in ice or in a thermos jug.

Preferred Site: On the arm at the insertion of the deltoid muscle. The leg is not recommended. If the vaccination is done properly and is properly cared for, it should not leave an unsightly scar.

Preparation: The site should be lightly cleaned with acetone or ether and allowed to dry; alcohol alone should *not* be used in skin preparation. If the area is not clean, it should first be washed gently with soap and water and then cleaned with acetone.

Method: A small drop of vaccine (one-half of tube) is placed on the site. The needle is held parallel to the skin. The point of the needle is lightly pressed through the vaccine and against the skin not more than 6-8 times. The area covered by the point of the needle should not exceed one-eighth of an inch. The excess vaccine may be removed by blotting with sterile gauze or cotton.

Caution: Too vigorous preparation of the skin or rubbing after the vaccine is placed may result in a much larger scar than is desired.

Dressing: If a clean, loose sleeve covers the arm, no dressing is ordinarily necessary or desirable. If, for special reasons the physician feels that a dressing should be applied, it should be applied loosely and never be of the occlusive type; i.e., not covered with adhesive or shields.

After care: The vaccinated area should be kept clean and dry. Scratching should be avoided. The overlying sleeve should be of smooth, nonirritating material. The scab should not be removed.

Evaluation of the vaccination

Vaccinia or regular "take" indicates absence of a protective level of immunity. Peak of reaction is reached in 8-12 days.

Accelerated reaction (vaccinoid) or partial "take" indicates partial immunity. Peak of reaction is reached in 3-8 days.

Immune reaction ordinarily indicates that the person had complete immunity. Reactions reaching their peak at 24 hours may be allergic. Itching, redness and papule formation should occur over the site at 48 hours after which the reaction rapidly subsides. Ordinarily this is not accepted as evidence of immunity in a previously unvaccinated person, who does not present evidence of previous smallpox infection.

An absence of any reaction indicates either poor vaccine or faulty technique. Vaccination should be repeated and observed carefully at 48 hours for presence or absence of an immune reaction.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

SECTION 2614. (a) The period of isolation shall be in accordance with Section 2516 until clinical recovery, and until the scabs have separated and the scars have completely healed.

Household contacts

(b) If the patient is isolated and the premises quarantined, the members of the household shall be confined to the quarantined area for at least 14 days after the termination of

the isolation of the patient, or for 14 days following removal of the case from the household by reason of death or hospitalization, except that any person who wishes to be released from the quarantined area may do so under the following conditions:

(1) If he has proved to the satisfaction of the health officer that he has had smallpox, or

(2) If he has proved to the satisfaction of the health officer that he has been successfully vaccinated against smallpox within the preceding five years, or

(3) If he has submitted to vaccination against smallpox, and has proved to the satisfaction of the health officer that the vaccination is successful or that there is evidence of immunity. Such contact shall remain in quarantine until released by the health officer with this evidence of protection.

(c) A person who has been exposed to the risk of contracting the disease by proximity to a case or to a suspected case of smallpox, shall be placed in quarantine for a period not less than 14 days from the last date of exposure. Such persons may be released if evidence of protection against smallpox is established to the satisfaction of the health officer as specified for household contacts.

(d) It shall be the duty of the local health officer to provide at public expense, free vaccination for all persons who have been exposed to a case of smallpox, or a case suspected of being smallpox.

Public Health Nursing Responsibility

Teach content included in above sections as well as:

a. Participate in community programs for continuous vaccination.
b. Assume responsibility for keeping vaccine below freezing up to the hour before vaccination clinic.

Complicating symptoms of the patient.

a. Sudden appearance of cough.
b. Acute inflammation at site of lesion.
c. Delirium.

Teach procedures for: Disposal of nose and throat discharges, disposal of dressings, disposal of uneaten food, care of dishes, care of linen, terminal disinfection.

STREPTOCOCCAL INFECTION

I. RESPIRATORY

A. SCARLET FEVER

B. STREPTOCOCCAL SORE THROAT, STREPTOCOCCAL NASOPHARYNGITIS, STREPTOCOCCAL TONSILLITIS, "SEPTIC SORE THROAT"

Recognition of the disease

A. Scarlet Fever (Scarlatina): The distinguishing characteristics are the rash (exanthem) and sore throat (enanthem). Injection of the pharynx involves the faucial pillars and soft palate, often extending to the hard palate; petechial foci are some times seen against the background of diffuse redness. Tonsils, if present often show the picture of acute follicular tonsillitis. The rash is usually a fine erythema, usually punctate, blanching on pressure, and appearing most commonly on the neck, chest, in the folds of the axilla, elbow, and groin, and on the inner aspect of the thighs. Pyrexia, nausea, and vomiting accompany severe infections. During convalescence desquamation is seen at the tips of fingers and toes, less often over wide areas including palms and soles.

B. Streptococcal sore throat, Streptococcal nasopharyngitis, Streptococcal tonsillitis, and "Septic sore throat": Characteristic manifestations are sore throat and fever, sudden in onset and accompanied by systemic manifestations of an acute infection. The pharyngeal mucosa of tonsils are injected or coated with exudate.

Etiologic agent

A. and B.: Hemolytic streptococci of Lancefield's group A. Some strains, particularly those which elaborate erythrogenic toxin (rash-producing factor) in high titer, produce either scarlet fever or the diseases classified under B. depending upon the skin reactivity of the patient as determined by the Dick test. Other strains appear generally incapable of causing scarlet fever and produce only the other streptococcal infections, regardless of the skin reaction of the patient.

Source of infection

A and B: Discharges from the nose, throat, of purulent complications of acutely ill or convalescent patients or carriers, or objects contaminated with such discharges. The nasal carrier is particularly important.

Mode of transmission

A and B: Direct transmission can occur by contact with infected individuals during the incubation stage, during the acute infection, or during convalescence. Floor dust may be an important vehicle. Explosive outbreaks may follow the ingestion of contaminated milk or other food.

Incubation period

A and B: Short, usually two to five days.

Period of communicability

A and B: This is not definitely known. Communicability can persist until the infectious process is healed. Individuals, especially children, with purulent complications may spread infection for many weeks. In uncomplicated cases the period of communicability may end with recovery from the acute infection and the danger of spreading infection ends in those cases

within two weeks. Throat culture findings are not a practical guide in determining communicability.

Susceptibility and immunity

A and B: No definite antibacterial immunity has yet been demonstrated to streptococcal infections, although there appear to be periods during which an individual may resist infection with a given strain of streptococcus. If infection occurs with a non-erythrogenic strain, the illnesses are as listed in B of this section, without rash. If an erythrogenic strain infects, the nature of the illness is determined by the individual's antitoxic immunity. Those without immunity (Dick positive) develop scarlet fever; those with antitoxic immunity (Dick negative) may have the other streptococcal respiratory infections listed in B.

Prevalence

A and B: Most common in the temperate zones, less common in the semitropical areas, and rare in tropical climates. Aside from food-borne epidemics, which may occur in any season, the highest incidence of scarlet fever in the United States occurs during the late winter and spring.

Methods of control

A and B:

The Infected Individual, Contacts, and Environment

Control of streptococcal infections depends on preventing the dissemination of hemolytic streptococci.

Recognition of the disease and reporting: On the basis of clinical examination.

Concurrent disinfection: All objects which have been soiled by purulent discharges and all articles which have been in contact with the patient.

Terminal disinfection: Thorough cleaning of contaminated objects, scrubbing of floors and sunning of blankets to prevent dissemination of infected particles.

Investigation of source of infection: Responsible authorities should determine whether an outbreak is caused by personal contact or by contaminated food or milk. Tracing outbreaks to an individual with a persistent streptococcal disease can often be accomplished by identification of the serologic type. Contaminated milk or food can be determined by culture.

General Measures

Provision for nose and throat cultures with isolation of hemolytic streptococci and identification of the serologic groups.

Education in the danger from infection with hemolytic streptococci whether or not scarlet fever is manifest in the patient.

Pasteurization of milk supply.

In the absence of an epidemic the milk from any cow with evidence of mastitis should be excluded from sale or use as a protection in addition to pasteurization.

Epidemic Measures

The majority of persons exposed to hemolytic streptococcal infections can be protected by the daily ingestion of an appro-

priate dose of penicillin under medical supervision. This does not obviate the necessity for appropriate personal precautions.

Observation for one week of persons exposed or potentially exposed.

Daily inspection of exposed children in school.

Segregation of persons with evidence of upper respiratory tract infection throughout the period of their clinical disease.

Prompt investigation of any group of cases as to possibly contaminated milk supply with exclusion of suspected milk supply from sale or use until pasteurized.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Cultural examinations of swabbings from the mucosa of affected areas in the throat and nose.

Due to the difficulty of maintaining the viability of the streptococcus outside the body no diagnostic service is available at present through the Division of Laboratories. It is recommended that the services of local public health or clinical laboratories which are properly equipped be used for this purpose.

Preciptin tests for group streptococci (Lancefield groups).

Typing of streptococci (Griffith types).

The two above procedures are not done at present at the Division of Laboratories.

Collection of specimens

Contact local laboratory and proceed as directed.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

SECTION 2616. (a) The patient shall be isolated in accordance with Section 2518 until complete disappearance of inflammation from the nose and throat, and the cessation of discharges from the nose, throat, ears, or suppurating glands, provided that such isolation shall continue for not less than seven days and until clinical recovery.

Contacts

SECTION 2616. (b) If the patient is properly isolated, quarantine of contacts is not required, except at the discretion of the local health officer. Judicious chemoprophylactic treatment of household contacts under medical supervision may be required by the health officer prior to release.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach importance of:

a. Excluding from school any child with a sore throat.
b. Adequate period of bed rest for the patient to prevent complications.

Instruct attendant to observe and report complicating symptoms such as:

a. Tenderness and swelling of glands in neck.
b. Pain, tenderness or discharge in or about ear.

c. Elevation of temperature.
d. Scanty urine output or unusually dark urine.
e. Redness, pain or swelling of joints.
f. Vague pains in long bones of arms and legs or in joints accompanied by headache and elevated temperature.

Teach procedures for: Disposal of nose and throat discharges, disposal of uneaten food, care of dishes, care of linen, terminal disinfection.

II. OTHER THAN RESPIRATORY

A. ERYSIPELAS

Recognition of the disease An acute, febrile infection of the skin, characterized by a red, tender, edematous, spreading skin lesion with a well-marked raised border. The central point (or point of origin) tends to clear as the periphery extends. Face and legs are the commonest sites for lesions. Recurrences are frequent.

Etiologic agent Hemolytic streptococci, of group A.

Source of infection Infected material from human sources containing hemolytic streptococci. Discharges from sinuses, draining ears, or mastoids may cause erysipelas in adjacent tissues.

Mode of transmission Bacteria entering breaks in skin either directly from same individual or indirectly from exogenous sources.

Incubation period Two to 10 days.

Period of communicability Until local lesion fades, provided there are no complications resulting in purulent discharges.

Susceptibility and immunity There is no immunity; recurrences are frequent. Susceptibility is most marked in infants, the aged, and individuals living in institutions. Healthy young adults rarely develop erysipelas unless the skin is broken, as for example by minute lesions around the eyes, nose, or mouth, or at the site of a surgical operation.

Prevalence Geographic and seasonal distribution similar to that of streptococcal respiratory tract infections.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease: By characteristic clinical picture.

Isolation: Isolation from susceptibles until inflammation has subsided.

Concurrent disinfection: Careful disposal of dressings and discharges from lesion.

Terminal disinfection: General, thorough cleaning of linen, blankets, room, etc.

Quarantine: None.

Immunization: None.

Investigation of source of infection: None.

Sulfonamide therapy is effective and, by shortening the disease process, will reduce risk to patient and to contacts.

General Measures

Personal cleanliness and avoidance of transferring infecting organisms into the broken skin.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

B. PUERPERAL INFECTION (PUERPERAL SEPTICEMIA)

Recognition of the disease

Rise in body temperature accompanied by local and general symptoms and signs of bacterial invasion of the genital tract of the post-partum patient. The causative agent can be recovered by culture of vaginal discharges and identified by serologic grouping and typing.

Etiologic agent

Usually hemolytic streptococci of group A. Infection may also be caused by anaerobic streptococci or by a mixed bacterial flora.

Source of infection

Hands and instruments used in examinations of the genital tract just prior to or during or following confinement; the nose and throat of the parturient woman or her attendants just prior to, during, or just after confinement; infectious processes and discharges of the genital tract prior to confinement.

Mode of transmission

Direct transfer to the tissues of the parturient canal by hands, instruments, dressings, by droplets discharged in speaking, sneezing, or coughing from infected or carrier individuals brought into close relation to the patient during or after delivery. Indirectly by articles soiled by infectious discharges brought into contact with the genital tract of the patient.

Incubation period

One to three days; rarely longer.

Period of communicability

During the persistence of infectious discharges from the genital tract of the patient.

Susceptibility and immunity

No immunity. The chief factors of susceptibility are the state of the parturient canal during and after confinement, the state of exhaustion, or fatigue, or chilling, and loss of blood of a patient following delivery, and the exposure of mucous membranes of the genital tract to trauma and contact in the course of the delivery.

Prevalence

The most common cause of preventable sickness and death related to childbearing. Epidemics occur particularly in institutions where aseptic techniques are faulty.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease condition.

Strict asepsis in obstetrical procedures with special attention to prevention of possible contamination by invisible spray

from mouth and nose, as well as by direct transmission from hands, instruments, etc.

Chemotherapy and chemoprophylaxis are of great value in the treatment and prevention of these infections.

Protection of patient (during labor and the post-partum period) from attendants and visitors with respiratory tract infections.

Education of women in the hazards of self-interruption of pregnancy.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No laboratory services available.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

SYPHILIS

Recognition of the disease

The primary lesion in an acquired infection is an ulcer (chancre) at the point of inoculation, followed by constitutional symptoms and lesions of the skin and mucous membranes (secondary lesions) which eventually heal regardless of treatment, but may recur during the first five years after infection. Late manifestations may be of infinite variety. Among the most important are affections of the cardiovascular and central nervous systems. In congenital syphilis, primary lesions are seldom seen, but more frequently secondary and late manifestations are observed. Confirmation of diagnosis should be sought by dark-field examination in primary cases and by serologic examination in all cases.

Etiologic agent

Treponema pallidum (Spirochaeta pallida)

Source of infection

Discharges from obvious or concealed lesions of the skin and mucous membranes, the semen, the blood of infected persons, and rarely, articles freshly soiled with such discharges or blood in which the *Treponema pallidum* is present.

Mode of transmission

By direct contact with infected persons or through the blood of such persons; chiefly by sexual intercourse, occasionally by kissing; by dental and other surgical or technical accidents, and rarely by indirect contact with articles soiled with discharges containing the organism; congenitally from syphilitic mother through the placenta.

Incubation period

About three weeks, minimum ten days, occasionally six weeks or longer.

Period of communicability

During the primary and secondary stages and during mucocutaneous recurrences. Inadequately treated patients may transmit infection through sexual intercourse for a period up to approximately five years but the most important period of communicability is during the earliest months or year or two of infection. Congenital transmission by the inadequately treated mother may take place throughout the child-bearing period.

Susceptibility and immunity

Recovery, following specific treatment, does not protect against subsequent infection. There is evidence that there may be some acquired immunity.

Prevalence

Widespread throughout the world varying with race, social customs, sex, and age. Most commonly acquired between the ages of 18 and 30. Differences in racial incidence are related to social rather than biologic factors.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms, confirmed by dark-field examination and by serologic reactions. As a general rule treatment should not be instituted without laboratory confirmation.

Concurrent disinfection of discharges from open lesions and of articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of sources and contacts of infection: Early cases of the disease should be traced to their source, and exposed contacts examined. All members of the family of a patient with congenital syhpilis should be examined. Marital partners of latent or late cases should be examined and where the female is infected, all children should be examined.

General Measures

Provision at public expense of adequate clinical and laboratory facilities, including the free distribution of drugs to physicians and medical service institutions for selected cases, and provisions of adequate follow-up to insure completion of treatment.

State legislation requiring antepartum serologic tests and legislation making physical and serologic examinations before marriage compulsory.*

Mass serologic examinations of special groups, such as employees in industry, residents of accessible localities where syphilis is highly prevalent, and examinations prior to entrance into the military services.

Repression of commercialized prostitution and of clandestine sex promiscuity, with the cooperation of appropriate social and law enforcement agencies.

Restriction of advertising of services or medicines for self treatment, and of the prescribing of treatment by persons other than physicians.

Public education as to the nature of syphilis and other venereal diseases, their clinical characteristics, prevalence, mode of transmission, and particularly as to how to avoid infection and to secure prompt examination and treatment if indicated.

Promotion of education in family life and human relations in schools for adult groups.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Dark-field examination for *Treponema pallidum.*

Complement fixation and flocculation tests on blood specimens.

Complement fixation, flocculation, colloidal gold and globulin tests on spinal fluids.

Collection of specimens

Material from lesion for dark-field: Collect serous exudate from lesions into capillary tube provided in regular mailing outfit supplied by the Division of Laboratories. Detailed instructions for collecting specimens will be found on the reverse side of the accompanying report slip. Avoid contaminating the specimen with red blood cells. They will yield the material unsatisfactory for examination.

* For California legislation, see Chap. 787 of the 1937 Statutes; the Civil Code, Div. 1, Part 3, Title 1, Chap. 1, Art. 2a, Sections 79.01-79.09 (premarital examinations); and Chap. 127, Acts of 1939 (prenatal examinations).

Blood specimens: Collect aseptically 5 cc. venous blood and place in sterile vial provided in regular Wassermann mailing outfit supplied by the Division of Laboratories or local health departments.

Spinal fluid: Collect aseptically 5 cc. spinal fluid uncontaminated by blood and place in sterile vial provided in regular Wassermann mailing outfit supplied by the Division of Laboratories. Mark report slip plainly as to type of examination desired.

Interpretation of results

Dark-field examinations: Positive report: Indicates organisms morphologically typical of *T. pallidum* were demonstrated in dark-field preparation. Negative report: No organisms resembling *T. pallidum* were observed.

Negative results on specimens from infected persons may result when antiseptics have been applied locally. Reliance should not be placed in one negative report. Repeated tests are recommended. Dark-field negative lesion cases should be followed for a minimum of three months with serologic tests.

Blood tests: Kline, Kahn and Kolmer Wassermann tests are done on all blood specimens excepting those excluded by a supersensitive precipitation test.

Negative report: Kline exclusion test negative (or Kline exclusion) Kahn and Kolmer negative if history indicates that all three tests are necessary. Positive report: Kahn or Kolmer or both show a strongly positive reaction. Doubtful report: Kahn or Kolmer or both show a weakly positive reaction.

All results are reported as positive, negative, or doubtful, except in the case of a quantitative Kolmer test, in which case the reaction and the number of units is stated.

A diagnosis of syphilis should never be established on one specimen only, unless definite clinical evidence is also present. One negative report does not exclude syphilis. A doubtful report calls for another test.

Spinal fluid tests: Kline exclusion and quantitative Kolmer complement fixation tests are done on all spinal fluids if there is sufficient material.

The results are reported positive, doubtful, and negative as indicated for blood tests, with the exception that the quantitative readings in the Kolmer are recorded and a titer in units on positive specimens.

Colloidal gold tests are reported by individual tube readings, zero indicating no reaction, Figures 1 to 5 indicating various degrees of precipitation of the gold (5 represents complete precipitation).

The globulin test is reported as no increase in globulin, slight, moderate, or great increase in globulin.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Section 2617. See section on Venereal Diseases.

Public Health Nursing Responsibility

Teach content included in above sections.

Participation in case finding by being alert to bring under medical care cases found through observation in home visits and schools.

a. Early cases—skin manifestations as unexplained body rashes, lesions, alopecia.
b. Late cases—cardiac complaints, neurological disorders, characteristic gait.
c. Congenital cases—chronic malnutrition, snuffles, interstitial keratitis, skin lesions of infants, saddle nose, Hutchinson's teeth, sabre shins.

Interview known cases for contact information when so ordered by physician or when nurse is assigned to clinic service.

Follow up sex contacts of known infectious cases when it is the agency's policy to have the public health nurse do this.

Teach value of early examination of pregnant women.

Participation in case holding by:

a. Individual patient education through interview.
b. Follow-up of cases until discharged from medical care.

Teach importance of:

a. Oral hygiene especially while under bismuth therapy.
b. Reporting symptoms of treatment reactions to physician.
c. Dietary discretion while under arsenical therapy.
d. Regular and continuous treatment.
e. Patient responsibility in the control of spread during infectious period.

Aid patient to overcome obstacles to continuous treatment and assist him to meet other social and economic personal and family problems.

Teach procedure for disposal of dressings and care of linen.

TAPEWORMS

(Cestode Infections)

Recognition of the disease

May occur with generalized or localized symptoms. Among the factors which cause these are the age and number of worms and the sensitivity of the host to toxic products of worm. Many patients have little or no symptoms, but diarrhea, fatigue, anemia, and abdominal pain may be present. Low eosinophilia is often found. Diagnosis requires recognition of proglottids or ova in feces.

Etiologic agent

Taenia saginata—Taenia solium.

Source of infection

Undercooked beef and pork respectively. Also feces of man in *Taenia solium.*

Mode of transmission

Ingestion of infected beef or pork. Feces of man infected with *T. solium* causes "cysticercosis."

Incubation period

Approximately three months.

Period of communicability

As long as ova are being discharged.

Susceptibility and immunity

Generalized throughout the world.

Prevalence

Not common in the United States. South America, China, and the Balkans are endemic foci.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Confirm clinical impressions with stool examinations or biopsies.

Isolation: None.

Concurrent disinfection: Feces should be treated with bichloride of mercury or lime.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Search for infected cattle, pigs, man as case warrants.

General Measures

Adequate laboratory facilities for diagnosis.

Public education where it is required on the ingestion of undercooked pork and beef.

Personal hygiene.

Sanitary excreta disposal.

Prohibit feeding of uncooked garbage to pigs.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of feces for ova and proglottids.

Collection of specimens

Place portions of feces in bottle provided in standard mailing outfit for amoebic dysentery supplied by the Division of Laboratories. Mark accompanying report slip plainly "For Tapeworm."

Interpretation of results

Positive: (1) If ova are present and are identified. Species will be stated whenever possible.

(2) If proglottids are present and can be identified.

Negative: No ova or proglottids found in specimens submitted.

Identification of species of ova is possible except for *Taenia solium* and *Taenia saginata*, which cannot readily be distinguished from each other except by study of the proglottids.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

TETANUS

Recognition of the disease

An acute disease caused by the toxin of the tetanus bacillus; characterized by painful muscular contractions, primarily of the masseter and neck muscles, and secondarily of those of the trunk; rarely the rigidity is confined to the region of the injury. A history and usually physical evidence of a wound of entry for infection are found. Superficial suppuration under a gauze dressing or a crust provides sufficient anaerobiosis for the tetanus bacillus to develop.

Tetanus neonatorum, resulting usually from infection of the unhealed umbilicus, appears first as a general illness of the infant, refusal to nurse, stiffness of the jaws, and later rigid convulsions ending almost invariably in death.

Etiologic agent

Tetanus bacillus, *Clostridium tetani.*

Source of infection

Soil, street dust, and animal feces.

Mode of transmission

Wound infection.

Incubation period

Commonly four days to three weeks, dependent somewhat upon the character, extent, and location of the wound. Longer periods of incubation have been noted. Subsequent operative interference or local tissue changes may initiate the activity of quiescent bacilli at even lengthy intervals after the original wound infection.

Period of communicability

Patient not infectious.

Susceptibility and immunity

Susceptibility general, but inoculated bacilli often fail to produce toxin. An active immunity may be produced by the use of tetanus toxoid but this requires reinforcing doses at appropriate intervals, and to meet particular exposure. Artificial passive immunity of about 10 days' duration can be relied upon from the use of tetanus antitoxin if thorough surgical debridement is carried out.

Prevalence

World-wide distribution, following wound infection. Most frequent in North America among young males and in summer. Prevalent especially following wounds contaminated with manured soil. Tetanus in the new born occurs where there is neglect of surgical asepsis and ordinary cleanliness in the care of the umbilical cord and its dressings in the first two weeks of life. The condition is a serious factor in infant mortality where midwives are ignorant or incompetent.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical symptoms rarely confirmed bacteriologically.

Concurrent disinfection: None.

Terminal disinfection: None.

Investigation of source of infection: Of only academic interest, as the infecting organism is widely spread. Occurrence in the newborn calls for rigid inquiry into the competence, and license or other authorization, of the attendant at the birth.

General Measures

Removal of all foreign matter as early as possible from all wounds.

Educational efforts such as "safety first" programs in industry and on the farms.

Licensing of all persons other than physicians authorized to attend confinements, with professional supervision and education of such persons as to methods, equipment, and the technique of asepsis.

Immunization

Who should be immunized

Children: Active immunization is recommended as a public health procedure in areas where there is a high risk of tetanus.

Adults: Active immunization is advised for those persons whose occupations predispose them to unusual chances of infection: Farmers, hostler, veterinarians, horsemen.

Properly administered tetanus toxoid including "booster" doses has proved a more efficient and less dangerous method of prevention than tetanus antitoxin. *It is advisable that the person should have with him at all times a record of his immunization in case of injury.*

Administration

Initial Series: Begin at six months of age in combination with immunization against pertussis and diphtheria.

Immunizing Agent: Alum precipitated or plain tetanus toxoid, each cubic centimeter of which contains one human dose according to National Institute of Health specifications. In children under five years of age, it is advisable to use the combined "triple" D.P.T. (diphtheria toxoid with pertussis vaccine and *tetanus toxoid*) unless separate immunization against pertussis and diphtheria has been carried out.

Dosage and Interval: When tetanus toxoid alum precipitated is administered separately, two injections of 1.0 cc. each are given deep subcutaneously or intramuscularly, separated by an interval of two to three months.

When tetanus toxoid is given in combination with diphtheria toxoid and pertussis vaccine, two injections (1 cc. and 1 cc.) at monthly intervals are administered deep subcutaneously or intramuscularly.

When using alum precipitated products, sterile abscesses will be minimized by exercising care not to have any material on the exterior of the needle. (Use separate needle for withdrawing toxoid from bottle, and a fresh needle if toxoid is ejected while expelling air bubbles.)

Reinforcing Injections: Following a hazardous injury, a "booster" injection of 1 cc. of *plain* tetanus toxoid should always be given if a previous initial series or "booster" dose has been administered within the past two years. Routine "booster" injections should be given one year following the completion of the initial series and repeated every two years. The dosage of the reinforcing injection is 0.5 cc. of either alum precipitated or 1.0 cc. of plain tetanus toxoid. The "booster" should be given in combination with a pertussis vaccine or a diphtheria toxoid,

or with a combined diphtheria-pertussis product if they are indicated from past experience.

Reactions

Reactions to tetanus toxoid or to combined diphtheria-tetanus-pertussis products are seldom severe in children under five years of age.

Passive immunization

In the absence of adequate previous immunization with tetanus toxoid, reinforced by another injection of toxoid at the time of injury, a person who has been wounded in such a way that there is danger from tetanus should receive a subcutaneous injection of tetanus antitoxin, 5,000 U.S.A. units (10,000 International units) on the day of the wound. A second injection within 10 days may be desirable in certain instances. Surgical care of the wound is also strongly recommended.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Cultural examinations and animal inoculation tests of curetting from wounds.

Collection of specimens

Place tissue fragments from curetted wound in sterile bottle. Special containers will be supplied upon request to the Division of Laboratories, or the standard tuberculosis mailing outfit may be used. Mark accompanying report slip plainly "For Tetanus."

Interpretation of results

Positive report: Indicates that an organism identified culturally as *C. tetani* has been isolated or that animal inoculation tests have given typical picture of *C. tetani* infection.

Negative report: No organisms resembling *C. tetani* isolated or animal inoculation tests not typical of *C. tetani* infection (death of the test animal and survival of the "control" animal protected with specific antitoxin.)

Animal inoculation tests are more reliable than cultures; a negative culture is not conclusive.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

Section 2618. Reportable only. No restrictions on case or contacts.

Public Health Nursing Responsibility

Teach content included in above sections as well as:

a. Medical care for all wounds with soil contamination.
b. Active immunization with tetanus toxoid if this is the policy of the local health department.

Teach symptoms to be noted and promptly reported to physician:

a. Restlessness.
b. Sudden change in temperature.
c. Difficulty in swallowing.
d. Muscle twitching and convulsions.
e. Cyanosis or respiratory difficulty.

TRACHOMA

Recognition of the disease

A specific destructive chronic inflammation of the conjunctiva, characterized by formation of granulations, either papillary or follicular, leading ultimately to formation of scar tissue, deformity of the eyelids, and involvement of the cornea. Microscopic examination of the conjunctival discharges and scrapings cannot be relied upon as an aid to diagnosis, but may exclude other infections.

Etiologic agent

A filterable virus.

Source of infection

Secretions and purulent discharges from the conjunctivae and adnexed mucous membranes of the infected persons.

Mode of transmission

By direct contact with infected persons and indirectly by contact with articles freshly soiled with the infective discharges of such persons.

Incubation period

Undetermined.

Period of communicability

During the persistence of lesions of the conjunctivae and of the adnexed mucous membranes or of discharges from such lesions.

Susceptibility and immunity

Susceptibility is general, greater in children than in adults and increased by malnutrition, chronic irritation by dust, wind, exposure to the sun, and by carelessness of personal cleanliness. Natural or acquired immunity is not known to occur.

Prevalence

World-wide, appearing in parts of all continents and most islands of the Pacific. Cases most common among children but may occur and persist at any age.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical signs and symptoms.

Concurrent disinfection: Of eye discharges and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Careful examination should be made of persons in any way intimately related or exposed to the patient, particularly members of the household, playmates, and schoolmates. Carriers are not known to occur, but apparently healed scars of old lesions may be sites of reactivity and become sources of infection.

General Measures

Search for cases by examination of school children, immigrants, and families and associates of recognized cases; in addition, search for acute secreting disease of conjunctivae and adnexed mucous membranes, both in school children and in their families, and treatment of such cases until cured.

Elimination of towels and toilet articles used in common.

Education in the principles of personal cleanliness and the necessity of avoiding direct or indirect transference of body discharges.

Control of public dispensaries where communicable eye diseases are treated, and creation of special treatment classes where trachoma is prevalent.

Exclusion of infected immigrants at national boundaries, or preferably at foreign port of embarkation.

Routine examination of eyes of children admitted to institutions, or adults in industrial concentrations where the disease is prevalent.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of films prepared from scrapings of conjunctival surface.

Collection of specimens

The secret of success in preparing films lies in the art of removing as many epithelial cells as possible from the conjunctival surface. In order to accomplish this, the eyelid should be everted, freed from pus by washing it with salt solution and the surface scraped with a single stroke of a small knife, taking care to cause as little bleeding as possible. The epithelial scrapings are now placed on a clean glass slide and spread evenly over its surface with the aid of another glass slide, after the usual manner of preparing a blood film, exerting only the minimum amount of pressure when so doing. Films prepared by rubbing a platinum loopful of conjunctival secretion on the surface of a slide must not be used when attempting to demonstrate inclusion bodies; likewise cotton wool swabs are unsatisfactory for this purpose.

It is advisable to make at least two smears. The regular gonorrhea outfits may be used for this purpose.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Case

Section 2620. The patient shall be isolated in accordance with Section 2518 during the acute stages and when not under medical treatment satisfactory to the health officer. No restrictions need be placed on contacts.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach importance of:

a. Understanding of the disease among racial and sectional groups most frequently affected.
b. Prompt report of eye pathology to proper agency.
c. Early treatment to prevent destruction of the conjunctiva.
d. Exclusion from school of suspected and diagnosed cases.

Teach procedures for: Disposal of dressings and care of linen. Instruct family to keep treatment utensils absolutely separate.

TREMATODE INFECTIONS, MISCELLANEOUS

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of feces for ova, similar examination of sputum for ova of lung fluke *(Paragonimus)*.

Collection of specimens

Use standard mailing outfit for amoebic dysentery provided by the Division of Laboratories. Place specimen of feces or sputum in bottle contained in outfit. Mark accompanying report slip plainly "For Trematodes."

Interpretation of results

Positive: Ova present in specimen identified. Specific type will be stated.

Negative: No ova found in specimen submitted.

In case of negative results, a series of specimens should be submitted before considering such results conclusive.

TRICHINOSIS

Recognition of the disease

In human beings confined to persons who have eaten raw or insufficiently cooked pork and pork products, or, rarely, bear meat, containing viable trichinae. Characterized by onset of variable intensity according to the amount of infected meat eaten and the abundance of trichinae in the meat. Nausea, vomiting, or diarrhea may be present. Muscle soreness or pain, edema of face and eyelids, laryngitis, subcutaneous hemorrhages, cough, pain in the chest, difficulty in swallowing, and labored breathing may occur, even pneumonia or involvement of the central nervous system in some cases. Fever is usual, not unlike that in typhoid fever. Eosinophilia is usually marked. It may occasionally be absent in overwhelming infections and in individuals suffering from concomitant bacterial or virus infections. The symptoms are extremely variable. Intradermal and precipitin tests should be employed as aids in diagnosis. Direct microscopic examination of a biopsied sample of deltoid or gastrocnemius muscle, pressed or digested in artificial gastric juice, may detect larvae after 21 days of infection. Occasionally, larvae may be found in the blood or spinal fluid.

Etiologic agent

Trichinella spiralis.

Source of infection

Uncooked or insufficiently cooked pork or pork products.

Mode of transmission

Only through consumption of meat containing viable larvae.

Incubation period

Usually the onset occurs six to seven days after ingestion of the infective meat. In heavy infections gastrointestinal symptoms may appear in 24 hours.

Susceptibility and immunity

Susceptibility is general. Neither natural nor acquired immunity is known to occur in man.

Prevalence

World-wide. The parasite is particularly widespread in the United States, about one in every six necropsies showing infection. Clinical cases probably occur more frequently than is indicated by morbidity reports and the disease is probably often confused with other illnesses. No selection by age, sex, race, region, season, or climate except as these affect the custom of eating the insufficiently cooked flesh of infected hogs.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical evidence, marked eosinophilia, and intradermal tests may be confirmed after three weeks of symptoms or of fever by examination of biopsied muscle for encysted larvae.

Concurrent disinfection: None.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Effort should be made to trace source of infection in pork or pork products believed to be involved in groups of cases.

General Measures

Inauguration of local and State meat inspection to assure adequate processing of all pork products not processed under federal inspection, and customarily eaten without further adequate cooking by the consumer.

Encouragement of farmers and hog raisers in the use of standard swine sanitation practices which will reduce opportunity for trichina infection in swine, such as:

a. Control of rats, particularly on farms and around hog-raising establishments and stockyards.
b. Burial or other adequate disposal of rat and swine carcasses to prevent hogs from feeding on them.

Elimination of the current practice of feeding uncooked garbage and offal to swine and the adoption and enforcement of suitable laws and regulations ensuring cooking such material before its consumption by swine.

Cooking of all fresh pork products by the consumer, at a temperature and for a time sufficient to allow all parts of the meat to reach a temperature of at least 65.6 degrees C. (150 degrees F.) unless it is known that these meat products have been processed under Federal or other official regulations adequate for the destruction of trichinae.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Complement-fixation test on blood specimens.

Examination of suspected meat for larvae *Trichinella spiralis*.

Collection of specimens

Blood specimens: After three weeks of the disease, collect aseptically approximately 5 cc. venous blood and place in sterile vial. Special containers will be supplied upon request to the Division of Laboratories or the standard "Wasserman" mailing outfit may be used. Mark accompanying report slip plainly "For Trichinosis Complement-Fixation."

Meat: Collect *lean* portions of suspected meat, place in suitable container, and mark plainly "For Trichinosis."

Interpretation of results

Complement-fixation: Positive report: Indicates presence of specific complement-fixing antibodies for *Trichinella* in patient's serum. Doubtful positive report: Indicates reaction too weak to be considered specific. Negative report: No fixation obtained.

False positive complement-fixation reactions in trichinosis are very rare, therefore, a positive report is probably confirmatory of clinical diagnosis.

Doubtful positive findings suggest the necessity of submitting further specimens taken several weeks later in the disease. Negative findings on a single specimen should not be considered conclusive. Repeated specimens should be submitted as complement-fixing antibodies may appear later in the course of the disease.

Meat: Positive report: Larvae of *Trichinella spiralis* demonstrated. Negative report: No larvae observed.

It is sometimes difficult to establish the presence of trichinae in suspected meat, especially in ground pork products. A negative result is not entirely conclusive. In the absence of other parasitic infections, the high eosinophilia may be of diagnostic aid.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2622. No restrictions on case or contacts. Reportable only. The health officer shall make an investigation to determine the source of infection. If the suspected product is a commercial product, the health officer shall report the fact at once to the State Department of Public Health. Case

Public Health Nursing Responsibility

Teach content included in above sections and encourage medical care for all persons presenting symptoms.

TRICHURIS INFECTION

(Whipworms)

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of feces for ova.

Collection of specimens

Take portions of feces from various parts of the stool and place in bottle provided in standard mailing outfit for amoebic dysentery supplied by the Division of Laboratories. Mark accompanying report slip plainly "For Ova."

Interpretation of results

Positive: If ova of *Trichuris trichiura* are present.

Negative: No ova found in specimen submitted.

Trichuris trichiura infection is usually asymptomatic unless very heavy. The worm may be present together with other parasites.

TRYPANOSOMIASIS, AMERICAN

(Chagas' Disease)

Recognition of the disease

The signs and symptoms most commonly attracting attention are unilateral bipalpebral nonpitting edema often extending to the face, reddish purple discoloration of the skin about the eye, inflammation and enlargement of the lacrymal gland, conjunctivitis, and regional lymphadenopathy, but these are not present in all cases. The acute stage lasts several weeks and is characterized by fever, malaise, enlargement of the spleen and liver, and in severe cases by cardiac enlargement, tachycardia, and arrythmias. Many infected persons, especially adults, have very few or no signs or symptoms and the infection can be proved only by finding the causative agent in the blood.

Etiologic agent

Trypanosoma cruzi.

Source of infection

Infected persons and a number of domestic and wild animals, such as dogs, cats, opossums, and armadillos.

Mode of transmission

Fecal material of infected insect vectors, various blood-sucking species of Reduviidae (cone-nosed bugs), especially the genus *Triatoma*, which frequently attack man. Contamination with infected fecal material from the bug, of the conjunctivae, mucous membranes, abrasions, or wounds in the skin made by the bite of the insect. It is probably not transmitted by the actual act of biting.

Incubation period

About 7 to 14 days.

Period of communicability

Not communicable from man to man.

Susceptibility and immunity

Children, especially infants under two years of age, are very susceptible and have a high mortality.

Prevalence

The disease has a wide geographic distribution in Central and South America. Cases have been found in southern Mexico. No human case has been reported as yet in the United States but several species of the insect genus *Triatoma* have been shown to be carriers of *Trypanosoma cruzi* in Texas, New Mexico, Arizona, and California.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: Clinical characteristics, demonstration of the organism in the blood by smear, culture, or animal inoculation, and the complement fixation tests.

Isolation: Protection from Reduviid bugs.

Concurrent disinfection: None.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Search of bedding and rooms for the vector, and investigation of infection among domestic and wild animals on the premises. All members of the family should be examined for infection.

General Measures

Construction or repair of dwelling so that they do not afford hiding places for the insect vector or shelter for the wild hosts.

Elimination of infected domestic animals and destruction of the habitations of the wild hosts in known endemic areas.

Use of a bed net in houses infested by the vector.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of blood smears.

Collection of specimens

Blood smears should be made on glass slides as for malaria and forwarded to the Division of Laboratories.

Interpretation of results

Positive report: Trypanosomes found on stained smears.

Negative report: No trypanosomes found.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

TUBERCULOSIS, PULMONARY

Recognition of the disease

Primary or first-infection type: Characterized by hilum gland enlargement or discrete parenchymal shadows in chest X-ray examination, usually with positive tuberculin tests, sometimes accompanied by vague constitutional symptoms, and rarely by erythema nodosum, all of which regress spontaneously except in occasional cases which develop meningitis or other progressive tuberculous disease. Recognition by X-ray findings, confirmed by staining, culture, and animal inoculation of stomach washings during the acute stage.

Adult or reinfection type: Characterized by insidious onset with parenchymal pulmonary infiltration, usually in the upper lobes, recognizable by X-ray examination, for a variable period of time before constitutional symptoms or physical signs appear. Pleurisy with effusion and unexplained hemoptysis are almost specific first symptoms: Cough, fever, fatigue, and weight loss accompany advanced disease, which is recognizable by X-ray examination and by physical signs of dullness and rales, and confirmed by staining, culture, and animal inoculation of sputum, or of stomach washings where sputum is absent or negative. Tuberculin test almost always positive. Failure to find organisms on microscopic examination of sputum does not rule out tuberculosis; repeated examinations of concentrated sputum and stomach washings by culture and animal inoculation will eventually demonstrate tubercle bacilli in the majority of active cases.

Etiologic agent

Tubercle bacillus (human), *Mycobacterium tuberculosis (hominis);* bovine type has been found in occasional cases in some areas (outside the continental United States) where milk is not pasteurized and infection of cattle is prevalent; avian type doubtful for human infections.

Source of infection

Persons with "open pulmonary tuberculosis; rarely tuberculosis cattle.

Mode of transmission

Usually through the discharges of the respiratory tract, by direct or indirect contact with infected persons, by means of coughing, sneezing, or other droplet infection, by kissing, by the use of contaminated eating and drinking utensils, and possibly by contaminated flies and dust. Infection rarely occurs from casual contact, but usually results from the continued type of exposure characteristic of family relationships.

Incubation period

Variable, dependent upon the type of the disease, dosage, age, and other factors.

Period of communicability

As long as the specific micro-organism is discharged by the patient. Commences when a lesion becomes an open one, i.e., discharging tubercle bacilli, and continues until it heals or death occurs. The degree of communicability varies with the number of bacilli discharged, the frequency of exposure, and the susceptibility of the persons exposed.

Susceptibility and immunity

Susceptibility is general; highest in children under three years, lowest from three to twelve years of age, and relatively high for the rest of life; in aboriginal races greater than in

races long exposed to the disease; in the undernourished, neglected, and fatigued more than in the well-fed and well-cared-for. The disease is more prevalent among persons with silicosis. Resistance of some degree is developed with age and by the maintenance of good nutrition. There is no evidence of natural specific immunity.

Prevalence

Among the most common communicable diseases of man, with less variation in prevalence of infection according to race than in mortality. In most occidental nations its incidence and mortality are declining. Age at which first infection occurs varies; children exposed in the household and in cities are infected earlier than rural children and those not so exposed, who may escape infection until adolescence or adult age. Mortality high among infants, among adult males up to old age, and among adolescent and young adult females. Leading cause of death at ages 15 to 34. Aboriginal races when first exposed develop the disease in a rapidly fatal form. The disease occurs at times in epidemics.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: *By use of X-ray examination followed by thorough medical examination supplemented by tuberculin testing when necessary and confirmed by bacteriologic examination of sputum and other materials. Routine examination of contacts, especially in family groups exposed to a person with "open" tuberculosis, is of great importance. Prompt reporting of all persons with active tuberculosis is essential to effective control.*

Concurrent disinfection: Of sputum and articles soiled with it. Particular attention should be paid to prompt disposal or disinfection of sputum itself, of handkerchiefs, cloths, or paper soiled therewith, and of eating utensils used by the patient. Patients should be trained to cover mouth and nose in coughing and sneezing.

Terminal disinfection: Cleaning.

Immunization: None.

Investigation of source of infection: Contacts of all known cases should be examined rontgenologically, with particular attention to elderly persons with chronic cough.

General Measures

Education of the public in regard to the danger of tuberculosis, the mode of spread, and the methods of control, with especial stress upon the danger of exposure and infection in early childhood.

Provision of X-ray and clinical facilities for examination of contacts and suspects, public health nursing service for home supervision of cases and for ensuring examination of contacts, and dispensary service for continuation of collapse therapy in ambulant cases and for clinical supervision of patients not otherwise so supervised.

Provision of adequate sanatorium facilities for isolation and treatment of active cases of the disease. At least two beds should be provided per annual tuberculosis death in the community.

Routine X-ray examination of all in-patients and out-patients in general and mental hospitals, and of selected groups of industrial workers and other adult population groups. Routine tuberculin testing of children is not a productive procedure for case finding.

Elimination of the inhalation of silica dust in dangerous quantity in industrial establishments and trades.

Pasteurization of all milk supplies.

Improvement of habits of personal hygiene and betterment of living conditions among the underprivileged.

Separation of babies from tuberculous mothers at birth.

Eradication of tuberculosis from dairy cattle.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Examination of sputum, pus, exudates, and body fluids by microscopic, cultural, and animal inoculation methods for presence of *Mycobacterium tuberculosis.*

Collection of specimens

Sputum: Collect sputum specimen in sterile bottle provided in standard "tuberculosis" mailing outfit supplied by the Division of Laboratories. Detailed directions for collecting specimens are given on the reverse side of the accompanying report slip. If examination other than microscopic test of specimen is desired indicate plainly "*For Culture*" or "*For Animal Inoculation*" on report slip.

Other specimens: Collect specimens aseptically and place in sterile bottle provided in the standard "tuberculosis" mailing outfit supplied by the Division of Laboratories. Fill out accompanying report slip indicating plainly type of specimen submitted. All specimens other than sputum will be examined routinely by each of the three methods described under Services Available. Since acid-fast organisms other than, but indistinguishable morphologically from, *M. tuberculosis* may be found in such specimens as gastric lavage, urine (especially uncatheterized) and pus, this procedure is particularly advisable.

Interpretation of results

Positive report: Indicates that acid-fast organisms typical of *M. tuberculosis* have been demonstrated in a smear of the concentrated specimen. An organism morphologically typical of *M. tuberculosis* the pathogenicity of which has been proved by animal inoculation has been obtained from culture of the concentrated specimen. Characteristic tuberculous lesions from which acid-fast organisms typical of *M. tuberculosis* have been demonstrated were observed in animal inoculated with concentrate of the specimen.

Negative report: No acid-fast organisms morphologically typical of *M. tuberculosis* were observed in smear of the concentrated specimen. No organisms typical of *M. tuberculosis*

obtained on culture. Inoculated animal showed a negative tuberculin skin test and showed no lesions suggestive of tuberculosis at the end of six weeks.

Positive cultural or animal inoculation findings on specimens which were negative microscopically do not constitute a conflicting report since these methods represent more sensitive means of detecting small numbers of tubercle bacilli.

Positive microscopic findings occasionally may be due to the presence of acid-fast bacilli other than those of tuberculosis.

Negative microscopic findings, even with concentration methods are in no way conclusive—a series of specimens may be advisable.

Negative results of culture or animal inoculation tests are of no value if preservative has been added to the original specimen.

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Case

SECTION 2624. Persons having tuberculosis in a communicable stage shall be considered as fulfilling the requirements of isolation as long as they are under adequate medical supervision and observe the instructions issued by the local health officer. The isolation shall be adequate for the protection of persons residing within the household as well as the public.

Persons having tuberculosis in a communicable stage, who refuse to observe the instructions of the local health officer and thereby needlessly expose others to infection, shall be placed in quarantine until such time as the local health officer feels that such quarantine is no longer necessary for the protection of the public; and, in the event that such quarantine proves inadequate for the protection of members of the household or community, the patient shall be placed in isolation in quarters designated by the local health officer, until such time as such isolation is no longer necessary for the protection of the public.

The person officially in charge of a sanatorium or other place where tuberculosis patients are cared for shall be responsible for immediately notifying the health officer in whose territory a patient resides whenever such patient having tuberculosis in a communicable stage leaves the institution.

Public Health Nursing Responsibility

Teach content included in above sections.

Participate in community education and case finding programs. Have definite statistical information on the age, racial and socio-economic groups in the local community who are most susceptible.

In addition to above, teach the importance of:

a. Routine X-ray of prenatal patients.
b. Continuous follow-up as advised by physician.
c. Early diagnosis.
d. Recognition of symptoms.
e. Methods of diagnosis.

f. Isolation of the patient.

Interpret:

a. Hospital facilities and prepare patient for hospital experience if available to him.
b. Community resources for:
    1. Economic or social assistance as indicated.
    2. Clinic follow-up.
    3. Tuberculin tests.
    4. Pneumothorax.
    5. X-ray.
c. Emotional responses of patient to self and family to relieve anxieties and fears.

When sanatorium, care is delayed, assist family in planning a long term of isolation of the patient to include:

a. Bed with durable spring and mattress.
    1. Back rest and foot rest or adequate substitute.
    2. Adequate linen and bedding for consistent comfort.
    3. Accessories such as bed lamp, reading rack, drink-tube.
b. Arrangement of room, bed, and equipment to prevent: Eye strain, orthopedic defects, pressure sores, fatigue, excessive activity.
c. Aid family to plan an adequate diet for the patient.

When sputum positive and patient is too ill or too uncooperative to protect attendant, he may be masked when nursing care is given.

Teach procedures for: Disposal of nose and throat discharges, disposal of dressings, disposal of uneaten food, care of dishes, care of linen, terminal disinfection.

TUBERCULOSIS, OTHER THAN PULMONARY

Recognition of the disease By local manifestations, by constitutional reactions, by the tuberculin test, and by identification of the tubercle bacillus in the lesions or their discharges through microscopic examination, culture, or animal inoculation.

Etiologic agent Tubercle bacillus (human and bovine) *Mycobacterium tuberculosis (hominis et bovis).*

Source of infection Persons with "open" pulmonary tuberculosis, less frequently tuberculous cattle.

Mode of transmission By direct contact with infected persons, by contaminated food, and possibly by contact with articles freshly soiled with the discharges of infected persons.

Incubation period Unknown.

Period of communicability Until discharging lesions are healed.

Susceptibility and immunity Susceptibility is general and is greater in children than in adults.

Prevalence Much less common than the pulmonary form and more rapidly falling in incidence, representing in the United States less than 10 percent of total cases and deaths from the disease. Especially common in infants and young children where intimately exposed to parental infection and to bovine infection through unpasteurized milk from tuberculous cattle.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Clinical signs and symptoms confirmed by bacteriologic examinations.

Isolation: None.

Concurrent disinfection: Discharges and articles freshly soiled with them. Instruction of patient in antiseptic precautions is important.

Terminal disinfection: Cleaning.

Quarantine: None.

Immunization: None.

Investigation of source of infection: Search should be made for possible original source in family, household, or other intimate contacts, and to discover previously unrecognized cases of similar origin; such a search to be aimed at discovery of infected but latent or arrested cases as well as those showing an active process. Special inquiry and investigation should be made to discover possible source of bovine tubercle infection where unpasteurized milk has been used in the family or particularly used uncooked by the patient.

General Measures

Pasteurization of milk and milk products.

Eradication of tuberculosis from dairy cattle.

Patients with open lesions should be prohibited from handling foods or attending upon children.

Adequate hospital, sanatorium, and out-patient facilities for discovery, control, and clinical management of infected persons.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

See section on Tuberculosis, Pulmonary.

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See section on Tuberculosis, Pulmonary.

TULAREMIA

Recognition of the disease

Whether the disease is acquired by the bite of the blood-sucking horse fly or the wood tick or from an infected abrasion or skin trauma or infected conjunctiva, or by ingestion of insufficiently cooked meat of infected rabbits, the onset is sudden, with pains and fever, and the patient is usually prostrated and confined to bed. If the disease follows a bite or a conjunctival infection or an infection through the skin, the lymph glands draining the area become swollen and tender, and suppurate in about half the cases. The fever is of three to four weeks' duration, and the convalescence slow. The clinical diagnosis may be confirmed by animal inoculation from local lesion, or from sputum in pulmonary cases, by isolation of micro-organism from cultures, and by agglutination reactions. Less reliable is the skin reaction.

Etiologic agent

Pasteurella tularensis (Bacterium tularense).

Source of infection

Wild rabbits and hares, horse fly *(Chrysops discalis),* wood tick *(Dermacentor andersoni* and *Dermacentor variabilis),* woodchuck, coyote, muskrat, opossum, tree squirrel, quail, skunk, water rat of Europe *(Arvicola amphibus),* cat, deer, dog, fox, hog, sage hen, and bull snake.

Mode of transmission

By bites of infected flies and ticks and by inoculation through handling infected animals, as in skinning, dressing, or performing necropsies on infected animals, or by fluids from infected flies, ticks, rabbits, and woodchucks. Ingestion of insufficiently cooked rabbit meat. Rare cases occur from bites of coyotes, skunks, hogs, cats, and dogs, where the mouth of the animal was presumably contaminated from eating infected rabbits. Drinking contaminated water. Infections acquired in the laboratory are not infrequent.

Period of Incubation

From 24 hours to 10 days, average slightly more than three days.

Period of communicability

There is no authentic record of transfer of the disease from man to man. The infecting micro-organisms have been found in the blood of man during the first two weeks of the disease; in conjunctival scrapings up to 17 days; in the primary lesion on the finger up to 21 days; in the sputum up to 31 days; in lymph glands up to five months; in bone marrow (sternum) 18 days after onset; in olecranon bursa five months after onset; in ulcer of the hand (not primary lesion) five months after onset; in ascitic fluid (taken during life) five months after onset; in pleural fluid five months after onset; in spinal fluid 16 days after onset; in the spleen taken at autopsy up to 30 days. Flies are infective for 14 days; ticks throughout their lifetime. Refrigerated rabbits kept constantly frozen at —15 degrees C. (5 degrees F.) may remain infective for 3½ years.

Susceptibility and immunity

All ages are susceptible. Permanent immunity follows recovery from an attack. An immune person may acquire through an abrasion on his hand and by contact with virulent material, a local tularemic papule which harbors virulent organisms but does not cause notable constitutional reaction.

Prevalence

The disease occurs throughout North America, in many parts of continental Europe, and in Japan. In the United States it occurs in every month of the year, but especially during the rabbit-hunting season. The case fatality is about 5 percent.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Human cases should be reported to the health department.

Concurrent disinfection: Disinfection of discharges from the ulcer, lymph glands, or conjunctival sac.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: Should be undertaken in each case. Advise use of streptomycin for therapy.

General Measures

Avoidance of the bites of, or handling of, flies and ticks when working in the infected zones during the seasonal incidence of bloodsucking flies and ticks.

The use of rubber gloves by persons engaged in dressing wild rabbits wherever taken, or when performing necropsies on infected laboratory animals. Employment of immune persons for dressing wild rabbits or conducting laboratory experiments. Thorough cooking of meat of wild rabbits.

Avoidance of raw drinking water in areas where the disease prevails among wild animals.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination tests on blood specimens.

Examination of material from lesions or pleural exudate in pneumonic type by cultural and animal inoculation tests.

Collection of specimens

Blood specimens: After 10 days of illness collect 5 cc. venous blood aseptically and place in sterile bottle provided in standard typhoid Widal mailing outfit. Check condition suspected *Tularemia* on accompanying report slip.

Material other than blood: Consult Division of Laboratories for special directions before collecting specimens for bacteriological examination. Special containers will be supplied upon request.

Interpretation of results

Blood specimens: Agglutination.

Positive report: Indicates a titer of 1-80 or higher.

Negative report: No agglutination or titer below 1-80.

It is advisable to submit a second or possibly a third specimen taken later in the disease as a significant titer may not be produced until the end of the second or third week after onset.

Specimens for bacteriological study: Positive report: Indicates organisms showing cultural reactions of *P. tularensis* has been isolated and its identification confirmed by animal inoculation. Negative report: No organisms resembling *P. tularensis*

were isolated. Inoculated animals showed no symptoms of tularemia.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2626. Reportable only. No restrictions on case or contacts.

Public Health Nursing Responsibility

Teach content included in above sections as well as procedures for: Disposal of nose and throat discharges, disposal of dressings, and care of linen.

TYPHOID FEVER

Recognition of the disease

A systemic infection characterized by continued fever, involvement of lymphoid tissues (especially with involvement and often ulceration of Peyer's patches), enlargement of spleen, usually rose spots on the trunk, diarrheal disturbance, and a variety of constitutional disturbances accompanying parenchymatous involvement of various viscera. There are many mild, atypical, and often unrecognized infections. Typhoid bacilli can be found in the blood, feces, and urine.

Etiologic agent

Typhoid bacillus, *Eberthella typhi.*

Source of infection

Bowel discharges and urine of infected individuals and carriers. About 2 to 5 percent of patients become permanent carriers. Family contacts may be transient carriers.

Mode of transmission

Conveyance of typhoid bacilli by direct or indirect contact with patient or carrier. Among indirect means of transmission are contaminated food, water, milk, and shellfish, and, under some conditions, flies.

Incubation period

From 3 to 38 days, usually 7 to 14 days.

Period of communicability

As long as typhoid bacilli appear in the excreta. Usually from appearance of prodromal symptoms, throughout illness and relapses during convalescence, and for varying periods of time after final cessation of all symptoms.

Susceptibility and immunity

Susceptibility is general, though many adults appear to have acquired immunity through unrecognized infections. Acquired immunity of permanent duration usually follows recovery. Artificial active immunity of probably two years' duration can be developed by inoculation with typhoid vaccine of high antigenicity. Protection persists for about one year at a high level and can be maintained by reimmunization.

Prevalence

Widespread throughout the world. Formerly endemic and epidemic in most large cities of North America and in many rural areas; still endemic in some rural areas of the United States, but commonly now occurring as sporadic cases and as small contact and carrier epidemics. Steadily falling in incidence, particularly in urban areas supplied with safe water and pasteurized milk, and where human excreta are disposed of without contaminating water supplies, food, milk, or surface of the soil.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease and reporting: Clinical symptoms confirmed by bacteriologic examination of blood, bowel discharges, or urine, and by specific agglutination test.

Concurrent disinfection: Disinfection of all bowel and urinary discharges and articles soiled with them.

Terminal disinfection: Cleaning.

Investigation of source of infection: The source of infection of every case should be determined by search for common

and individual sources, (1) unreported cases and carriers,* (2) contaminated food, water, milk, and shellfish.

General Measures

Protection and purification of public water supplies; construction of safe private supplies.

Sanitary disposal of human excreta.

Pasteurization of milk and milk products and aging of cheese for not less than 60 days at 2 degrees C. (35 degrees F.).†

Limitation of collection and marketing of shellfish to those from approved sources.

Supervision of other food supplies, and of food-handling practices.

Prevention of fly breeding.

Discovery and supervision of typhoid carriers, and their exclusion from the handling of foods.

Instruction of convalescents and chronic carriers in personal hygiene, particularly as to sanitary disposal of excreta, handwashing after use of toilet, and restraint from acting as food handlers.

Epidemic Measures

Exclusion of suspected milk supplies on epidemiologic evidence pending discovery and elimination of the cause of contamination of the milk.

Exclusion of suspected water supply, until adequate protection or purification is provided unless all water used for toilet, cooking, and drinking purposes is boiled before use.

Education of the general public and particularly of food handlers concerning the sources of infection and modes of transmission.

Immunization

Who should be immunized

Immunization against typhoid fever and the paratyphoids is not recommended as a routine public health procedure in California except as follows:

a. Individuals of any age upon exposure in the presence of epidemics or community disaster, in areas where sanitation is uncertain and for most foreign travel.
b. Contacts of known carriers or cases.
c. Patients and employees in state institutions.

Administration

Immunizing agents: Typhoid vaccine and triple vaccine (typhoid, paratyphoid A and B). Triple vaccine causes more severe reactions than typhoid vaccine alone and should be used only when protection is required against the paratyphoids as well as against typhoid fever.

* The diagnosis of a chronic carrier, as defined in the California State Board of Public Health Regulations, ordinarily requires the submission of two or more positive specimens. Positive specimens are more likely to be obtained following the administration of suitable saline catharses.

† For California legislation, see Agricultural Code, Division 4, Chapter 2, Article 6.

Dosage: Three injections are given subcutaneously at weekly intervals or longer—adults receive 0.5 cc., 1.0 cc., and 1.0 cc.; children receive smaller doses than adults, usually not less than one-half adult dosage. 0.1 cc. intradermally for three weekly injections is proving satisfactory. Individuals who have had several typhoid immunizations in the past may not tolerate the vaccine well and should receive only a single small dose.

Reinforcing dose: 0.5 cc. of vaccine is given subcutaneously every three years, or 0.1 cc. intracutaneously every three years.

Reactions

Local and general reactions are not uncommon. They occur with greater frequency in persons who have received previous typhoid immunizations.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Blood cultures for isolation of organism.
Blood for agglutinations.
Feces and urine specimens.
Bacteriophage typing of cultures of *Salmonella typhosa*.

Collection of specimens

Blood cultures: 5 cc. of venous blood collected aseptically in special bottle containing ox bile and provided by the Division of Laboratories. (Complete directions for collecting specimen is on the reverse side of the laboratory report slip accompanying the container.) The specimen should be collected as early as possible after onset of disease. Repeated specimens are often of value.

Blood for agglutination: 5 cc. of venous blood collected in a sterile vial which is included in the blood culture outfit.

Feces and urine specimens: Following detailed instructions accompanying the special mailing outfits provided by the Division of Laboratories, collect a sample feces about the size of a sphere one-half inch in diameter. If feces is liquid, collect approximately 1 cc. Approximately 1-2 cc. of urine is collected at the same time.

Cultures for bacteriophage typing: Local laboratories may submit cultures for typing. These cultures should be submitted on a sugar-free medium (plain agar). Special containers for this purpose may be obtained upon request from the Division of Laboratories.

Interpretation of results

Blood cultures: Positive report: Organism isolated and identified as *E. typhosa.* Negative report: No growth obtained.

For early diagnosis a blood culture is the best diagnostic aid. Chances for obtaining positive cultures are better during the first five days after onset than at any other time. However, if culture is negative, a second blood culture is advisable unless typhoid fever has been ruled out on other evidence.

Blood for agglutination: Positive report: Indicated by a titer of 1-80 or over. Negative report: No agglutination obtained or titer is below 1-80.

Agglutinins may appear about the tenth day after onset and persist for an indefinite period. A low titer may be due

to previous vaccination, but a definite rise in the titer is suggestive of infection. Therefore, repeated specimens are advisable.

Feces and urine specimens: Positive report: Organism isolated and identified as *E. typhosa*. Negative report: No organisms found which resemble *E. typhosa*.

Isolation of *E. typhosa* may mean that the patient is a temporary or chronic carrier or that the organism isolated is the cause of the illness. *E. typhosa* may be discharged intermittently from cases and carriers, especially from the latter. It is important, therefore, that repeated specimens are submitted until a positive result is obtained, unless typhoid fever has been ruled out on other evidence. See regulations regarding release of cases and carriers.

Cultures for bacteriophage typing: If typable, the specific type found will be reported. If not typable, it may be a type for which no specific bacteriophage is available or may be resistant to bacteriophage typing.

Bacteriophage typing is of value in relating cases to the source of infection.

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Case

SECTION 2628. (a) The period of isolation in accordance with Section 2516 shall be until the acute symptoms have subsided and two specimens of feces and urine taken successively at intervals of not less than five days have been determined by the laboratory to be negative for typhoid bacilli. The patient shall not take any part in the preparation, serving, or handling of milk or other food to be consumed by individuals other than his immediate family; nor shall he participate in the management of a dairy or other milk distributing plant, boarding house, restaurant, food store, or any place where food is prepared or stored; nor shall he engage in any occupation bringing him in contact with school children: Until three successive feces and urine specimens taken at intervals of not less than five days have been determined by the laboratory to be negative for typhoid bacilli.

Contacts

(b) No restrictions, except that no member of the household shall have any part in the preparation or serving of food to persons other than members of his immediate family; nor shall he engage in any occupation which brings him in contact with milk, milk products, milk bottles, or milk utensils. If members of the household are public food handlers and wish to resume their occupation, they shall leave the premises on which the case is isolated and submit at least two feces and urine specimens to the health officer and prove to the satisfaction of the health officer that they are free from infection before resuming their occupation.

Milk supply

(c) When a milk supply is thought to be the source of infection for typhoid fever, the health officer shall prohibit the sale of such milk until such time as he deems it to be safe for human consumption.

(d) When a case of typhoid fever is confined on the premises where a dairy is maintained, the health officer shall prohibit the sale of such milk until he is satisfied that such is safe for human consumption.

Carriers defined

(e) Any person whose feces or urine contains the bacilli causing this disease and who is not ill shall be reported as a carrier.

Any person who has been free from symptoms of this disease for one month and whose feces or urine contains the bacilli causing this disease shall be reported as a *convalescent carrier.*

Any convalescent carrier whose feces or urine continues to contain any of these bacilli after one year following clinical recovery, shall be reported as a *chronic carrier,* and any person whose feces or urine contains any of these bacilli but gives no history of recently having had the disease shall be recorded also as a *chronic carrier.*

Health officer's visits to carriers

(f) The local health officer shall visit each carrier in his territory at least twice a year to check on the occupation, address, and other activities of the carrier, and to determine if all instructions are being carried out.

Cultures to be sent to State Laboratory

(g)* All laboratories making examinations for the identification of typhoid carriers shall in all positive cases, forward to the State Division of Laboratories a culture of the organism, the isolation of which established the diagnosis.

Carrier restrictions

(h) When any known or suspected carrier of this disease is reported to or determined by the local health authority, he shall make an investigation, submit a report to the State Department of Public Health and obtain second specimens of feces and urine to be submitted to the Division of Laboratories, State Department of Public Health, for confirmation. Any known or suspected carrier of this disease shall be subject to modified isolation and the provisions of this isolation shall be fulfilled during such period as he complies with the instructions issued by the State Department of Public Health and the local health officer. Such instructions shall be given to the carrier in writing by the local health officer and shall include the following requirements:

(1) The individual shall not have any part in the preparation, serving or handling of food which may be consumed by any person other than members of his immediate family; nor shall he be engaged in any occupation which brings him in contact with milk, milk products, milk bottles, or milk utensils; nor shall he participate in the management of a dairy or other milk distributing plant, boarding house, restaurant, food store, or any place where food is prepared or served; nor shall he reside on the premises of any such food handling establishment; nor shall he engage in any occupation bringing him in contact with school children.

* Identical with Section 1079 (a), Chapter 2, California Administrative Code, Title 17, Public Health.

(2) Every member of the carrier's family shall be encouraged to be immunized against typhoid fever and such immunization should be repeated at least every three years.

(3) The carrier shall wash his hands thoroughly with soap and hot water and a nail brush after using the toilet and before handling food in his home.

(4) If the premises on which the carrier resides is provided with an outdoor privy, the carrier shall have on hand at all times an adequate supply of quicklime and use it as instructed. The privy shall be kept at all times in a sanitary condition and screened against flies.

(5) The carrier shall keep the local health officer informed at all times of his address and occupation, and notify the health officer at once of any contemplated change in his address or occupation.

(6) The carrier shall communicate with the health officer before submitting to any type of treatment intended for the cure of the carrier condition.

(7) He shall report to the health officer immediately any cases of illness suggestive of typhoid in his family or among his immediate associates.

(8) The carrier shall not live or work upon the premises of a dairy except with the written permission of the Director of the State Department of Public Health.

Requirements for release of carriers

(i) Carriers of typhoid bacilli shall not be released from restrictions unless the following requirements are met:

(1) *Fecal carriers*—Where the individual was determined to be a carrier on the basis of only one positive feces specimen, release may be granted by the Director of the State Department of Public Health upon fulfillment of the following conditions:

One authentic stool and urine specimen monthly for five months followed by one bile specimen and then another stool and urine specimen. If all of these are reported as negative, the carrier is freed from supervision. If any one of the specimens is positive, the individual is not released until the following provisions included in this section are met. If the individual who is to be released is a food handler or nurse, the procedure is the same except that two additional bile specimens are to be required.

Where the individual was determined to be a chronic carrier on the basis of two or more positive specimens and wishes to be released, the following procedure must be carried out before release will be considered:

Surgical removal of the gall bladder. Positive duodenal specimen should be obtained before surgery. Unless a positive duodenal specimen is obtained, it is not advisable to operate, as the infection may not be localized in the gall bladder. In submitting duodenal specimens the surgeon shall be certain that the specimens contain bile. The health officer is to be notified by the surgeon before the operation is undertaken.

After clinical recovery of the patient following the operation, the following procedure shall be carried out: Eight suc-

cessive negative feces specimens taken not less than two weeks apart and three successive negative duodenal specimens taken not less than two weeks apart.

(2) *Urinary carriers*—Not to be released at any time except in those instances where removal of the infected kidney has been performed, followed by six successive negative urinary specimens taken at monthly intervals. In those instances in which the carrier status was determined by only one positive specimen, release may be granted by the Director of the State Department of Public Health when six negative urinary specimens taken at monthly intervals have been obtained.

Release of carriers

(j) If, after all requirements cited in (h) have been met to the satisfaction of the Director of the State Department of Public Health, he may grant a release to the individual if he feels that the person is no longer a menace to the public health.

Laboratory tests

(k) Whenever laboratory tests are required for the release of typhoid cases or carriers, the tests shall be taken by the health officer or his representatives under such conditions that he can certify as to their being authentic specimens of the individual, and shall be submitted to a laboratory approved by the State Board of Public Health for such purposes. Specimens may be sent to laboratories not so approved provided the specimens are divided and portions of the specimens are sent to an approved laboratory. Release shall be considered on the basis of the report of the approved laboratory only.

Public Health Nursing Responsibility

Teach content included in above sections.

Teach symptoms which should be immediately reported to physician:

a. Rectal bleeding.
b. Blood in stools.
c. Sudden acute abdominal pain.
d. Cold perspiration.
e. Sudden change in pulse rate or temperature.

Teach attendant:

a. How to read and care for thermometer.
b. How to collect urine and stool specimens for laboratory examination.
c. Procedures for: Care of dishes, care of linen, disposal of excreta, terminal disinfection.

UNDULANT FEVER

(Brucellosis)

Recognition of the disease

A general infection with gradual or insidious onset and characterized by irregular fever of uncertain but often prolonged duration, profuse sweating, chills (or chilliness), pain in joints and muscles. Agglutination test and identification of the infecting micro-organism in the blood, tissues, or discharges of the patient are valuable aids in diagnosis. An obscure form of the disease, diagnosed only with difficulty, may last for years.

Etiologic agent

Brucella melitensis, Brucella abortus, Brucella suis.

Source of infection

The tissues, blood, raw milk, and urine of infected animals, especially goats, cattle, and swine. Laboratory infections take place readily.

Mode of transmission

By ingestion of raw milk from infected animals and by direct contact with infected animals or animal products.

Incubation period

Six to 30 days or more.

Period of communicability

Practically not communicable from person to person but the organism may be present in the urine or other discharges.

Susceptibility and immunity

Susceptibility is not general, as most persons have some degree of resistance, especially to the abortus strains of the infecting agent, or they have acquired partial immunity by ingestion of small doses of these. Duration of immunity uncertain.

Prevalence

Occurs more often in males than in females, and particularly in persons whose occupation brings them into direct contact with milk, cows, hogs, or goats, and in persons using unpasteurized milk of cows or goats. Found in every one of the United States and in Canada, affecting persons of all races. Occurs most often in the months of May to October. Many cases of a mild type doubtless occur without record.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: The clinical picture and particularly the undulant character of the fever, supplemented by exact determination through the use of agglutination tests and bacteriologic examination of the blood and urine for the infecting micro-organism.

Concurrent disinfection: Ordinary sanitary precautions. *Extreme care is necessary in laboratory work when dealing with Brucella.*

Terminal disinfection: None.

Investigation of source of infection: Human cases should be traced to the common or individual source of infection, usually to infected domestic goats, swine, or cattle, or to the unpasteurized milk products from cows and goats.

General Measures

Pasteurization of milk whether from cows or goats.

Search for infection among livestock by agglutination reaction and elimination of infected animals from the herd by segregation.

Vaccination of calves.

Education of the public and particularly workers in slaughter houses, packing houses, and butcher shops, as to the nature of the disease, the mode of transmission, and the danger of handling carcasses or products of infected animals.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Agglutination tests on blood specimens.

Blood cultures for Brucella.

Special studies on suspected material available through special arrangement.

Collection of specimens

Blood for agglutination tests: After tenth day of illness collect 5 cc. venous blood aseptically and place in sterile vial provided in standard typhoid agglutination mailing outfit. Mark condition suspected *"Undulant Fever."*

Blood for cultures: By special arrangement proper containers will be supplied by the Division of Laboratories and instructions for collection of specimens will be given.

Material for special studies: Contact the Division of Laboratories in case it is desired to culture urine, feces or other suspected material. Special instructions will be given.

Interpretation of results

Agglutination: Positive report: Agglutination obtained in titer 1-80 or higher. Negative report: No agglutination or titer is below 1-80. Strong agglutination is highly suggestive and confirmatory of suspected brucellosis. Weak reactions may have significance in many cases. A rise in titer is additional confirmatory agent.

Some infected persons never develop detectable agglutinins hence negative findings are not conclusive.

Blood cultures: Since Brucella are present in the blood stream in detectable numbers only intermittently and since this is most likely to occur during febrile episodes, negative results on a single specimen are not conclusive. A series of specimens is recommended. Positive findings—The isolation and identification of Brucella spc. are diagnostic. Special studies—Under certain circumstances the Brucella organism may be recovered from the urine or feces.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2634. Reportable only. No restriction on case or contacts.

Public Health Nursing Responsibility

Teach content included in above section.

Demonstrate a method of home pasteurization of milk when the need is indicated.

Assist family to provide conveniences for the patient who needs a long term of bed rest.

Encourage routine testing of milk cows and goats for Bang's disease.

VENEREAL DISEASES

For description of specific disease, see sections under name of that disease.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2636. (a) Sections 2636 (a) to 2636 (m) inclusive pertain to the venereal diseases and, unless otherwise specified, shall include syphilis, gonococcus infection, granuloma inguinale, lymphogranuloma venereum, and chancroid. (See Chapter 787 of the 1937 Statutes.)

Reports confidential

(b) Reports of examinations, cases, investigations and all records thereof made under the regulations for the control of venereal diseases shall be confidential and not open to public inspection and no part thereof divulged, except as may be necessary for the preservation of the public health.

Report of unusual prevalence

(c) When the local health officer, through investigation, becomes aware of unusual prevalence of venereal diseases, or of unusual local conditions favoring the spread of these diseases, he shall report the fact at once to the State Department of Public Health.

Parents or guardians responsible for compliance of minors

(d) The parents or guardians of minors suffering from a venereal disease shall be legally responsible for the compliance of such minors with the requirements of the regulations relating to the venereal diseases.

Certification

(e) Each local health officer shall take every proper means of repressing prostitution, inasmuch as it is the most prolific source of the venereal diseases. Health officers and physicians shall not issue certificates of freedom from venereal diseases to known prostitutes, as such certificates may be used for purposes of solicitation.

Diagnosis

(f) The local health officer may require the submission of such specimens as may be designated from cases of venereal disease or from individuals suspected of being infected with a venereal disease for examination in a laboratory approved by the State Department of Public Health. The local health officer may require any physician in attendance on a person infected with a venereal disease or suspected of being infected with a venereal disease to submit such specimens as may be designated for examination in a laboratory approved by the State Department of Public Health provided, however, nothing shall prevent the physician or individual from having additional examination made elsewhere.

Instructions to the patient

(g) It shall be the duty of the physician in attendance on a person having a venereal disease, or suspected of having a venereal disease, to instruct such patient in precautionary measures for preventing the spread of the disease, the seriousness of the disease, and the necessity for prolonged treatment, and the physician shall, in addition, furnish approved literature on these subjects. Approved literature for distribution to patients may be secured from the State Department of Public Health and the local health departments free of charge.

(h) All city, county and other local health officers are hereby directed to use every available means to ascertain the existence of, and immediately to investigate, all reported or suspected cases of venereal disease in the infectious stages within their several territorial jurisdictions, and to ascertain the sources of such infections. The attending physician, in every case of venereal disease coming to him for treatment, shall endeavor to discover the source of infection, as well as any sexual or other intimate contacts while the patient was in the communicable stage of the disease. The physician shall make an effort, through the cooperation of the patient, to bring these cases in for examination and, if necessary, treatment. If, within 10 days of identification, any such source of infection or any such contact has not given satisfactory evidence of being under the care of a physician, such person shall be reported to the health officer, the physician's name being kept confidential in any investigation by the health department. In cases in which prostitutes are named as sources of infection, all obtainable information as to name, description, residence, etc., shall be given to the health officer at once. Investigation

In carrying out such investigations, all health officers are hereby invested with full powers of inspection, examination and quarantine of all persons known to be infected with a venereal disease in an infectious stage, or suspected of being infected with a venereal disease in an infectious stage and are hereby directed:

(1) To make such examinations as are deemed necessary of persons reasonably suspected of having a venereal disease in an infectious stage.

(2) When the individual to be examined is a woman, to provide the services of a woman physician if such physician is available, when so requested by the individual to be examined.

(3) To isolate or isolate and quarantine such persons, whenever deemed necessary for the protection of the public health. In establishing quarantine the health officer shall proceed as provided in Sections 2636 (i), 2636 (j), 2636 (k), and 2636 (*l*).

(i) A case of gonococcus infection shall be regarded as communicable and subject to quarantine until the following requirements have been fulfilled: Gonococcus infection

(1) *Males*

A. Freedom from discharge.

B. Clear urine, no shreds, or shreds negative for gonococci.

C. The pus expressed from the urethra following prostatic massage must be negative for gonococci on three successive examinations at intervals of not less than 48 hours.

D. Since the above is only presumptive evidence of noninfectiousness, such patients shall be kept under observation for a minimum period of three

months as a reasonable safeguard against relapse or carrier state.

(2) *Females*

A. Two successive negative examinations for gonococci of the secretions of the urethra, vagina and of the cervix at intervals of not less than 48 hours and one additional examination shall be made within three days after cessation of menstruation.

B. Same provision as (1) D, above.

(3) *Both Sexes*

A. A check for syphilis by an approved serologic test any patient who is under treatment for gonorrhea, before such patient is finally discharged as cured.

Syphilis

(j) Cases of syphilis shall be regarded as communicable and subject to quarantine until, under treatment, all syphilitic lesions of the skin or mucous membrane are completely healed and a competent clinical examination fails to show the presence of any area from which infectious matter may be disseminated. Any cases who refuse standard accepted treatment or discontinue treatment prematurely, may be subjected to quarantine regulations if the health officer deems it necessary. Those cases who may be especially subject to quarantine are:

(1) All untreated cases of syphilis, irrespective of the presence or absence of visible lesions, except those who prove to the satisfaction of the health officer that the disease is more than four years duration.

(2) Females in the child-bearing age, regardless of the duration of infection, except those with congenital syphilis, who shall be considered as in (1).

(3) All treated cases, in either (1) or (2) who have received less than the equivalent of 20 injections of each of an approved arsenical and an approved heavy metal within a period of one year. However, this is not to be interpreted to indicate that this is considered adequate therapy, but rather that it is given as a minimum to provide a reasonable safeguard to public health. Any case of infectious relapse, or serologic relapse occurring within the first four years after infection, from the standpoint of this provision shall be subject to the same further treatment as though it were an early case, regardless of the amount of initial treatment.

Quarantine

(k) Any person now under treatment, or who shall hereinafter present himself (or herself) to any physician or person for treatment or diagnosis of any venereal disease, shall be considered to be in quarantine. The requirements of quarantine shall be considered fulfilled when the patient is reported as provided for in Sections 2500, 2636 (h), 2636 (i), and 2636 (j), and as long as he (or she) remains under the treatment of any one permitted under the laws of California to treat disease, except that in instances in which, in the opinion of the health officer, because of occupation, suspicion of prostitution, or other

reason, isolation as authorized in Section 2636 (h) (3) is deemed reasonably necessary to safeguard other persons.

Violation of quarantine to be reported

(*l*) Whenever any person, while in the infectious or potentially infectious stage of a venereal disease, lapses from treatment for a period of more than 10 days after the time appointed for such treatment, the said diseased person shall be deemed to have violated quarantine, and the physician or person in attendance upon such case shall report the same at once to the local health department, giving the person's name, address, and report number, together with such other information as requested on the card provided for this purpose, except that this shall not be required in instances in which a report has been received that the patient is under treatment elsewhere.

(m) If any person has knowledge that a person infected with a venereal disease is failing to observe adequate precautions to prevent spreading infection, he shall report the facts at once to the local health officer.

VINCENT'S ANGINA

(Trench Mouth)

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Microscopic examination of smears of exudate or pus from affected areas.

Collection of specimens

With sterile cotton swab collect exudate or pus from affected areas and make smears on clean microscopic slides. Allow film to air dry.

Special containers will be provided upon request or the standard diphtheria mailing outfit may be used in which case smears will be made at the laboratory. Mark accompanying report slip plainly "For Vincent's Angina."

Interpretation of results

Positive: A positive report is given if many spirochetes and fusiform bacilli typical of Vincent's infection are present on the smear.

Negative: If only a few spirochetes and fusiform bacilli are seen or if none are present.

The organisms usually associated with Vincent's infection are sometimes found on apparently healthy mucous membranes, particularly those of the mouth. For that reason a positive result should be interpreted with caution, placing the greater reliance upon the clinical picture. Since these organisms grow readily in diseased tissues, they may not be the cause of the condition.

VULVOVAGINITIS IN CHILDREN

Recognition of the disease

An inflammation of the urogenital tract in females, chiefly the vulva and vagina, characterized by redness and swelling of the mucous membranes and by moderate or copious purulent discharges. In severe cases, there may be excoriation of the labia and thighs, and extension of the disease to the uretha, bladder, and rectum. The infection may be primary, as in gonorrhea, or secondary to other diseases such as measles, chickenpox, and oxyuris infections.

Etiologic agent

A variety of organisms, including the *Neisseria gonorrhoeae*. (See section on Gonorrhea.)

Source of infection

Discharges of infected persons.

Mode of transmission

By direct contact with infected persons and by contact with articles freshly soiled with the discharges of such persons. In children, usually spread by other than sexual contact.

Incubation period

Variable.

Period of communicability

As long as the causative organism is present in discharges.

Susceptibility and immunity

Susceptibility appears to be general among female children. One attack does not protect against subsequent infection.

Prevalence

Widespread; most common in families where there are overcrowding, neglect in personal cleanliness, and ignorance as to sanitary precautions. Epidemics are observed most frequently in child-caring institutions, day nurseries, and schools.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease: Clinical symptoms confirmed by bacteriologic examination of discharges by smear and cultural methods.

Isolation: Until clinical recovery, and causative organisms are no longer present in discharges from the genitourinary tract.

Concurrent disinfection: Discharges from lesions and articles soiled therewith.

Terminal disinfection: None.

Immunization: None.

Investigation of source of infection: In the sporadic cases of vaginitis among children (particularly those of gonorrheal origin) thorough search should be made both among adults and children for other cases in the household. During epidemics among institutional and other groups, all children exposed should be examined and attempts should be made to determine the source of infection, such attempts to include the examination of attendants when indicated.

General Measures

Prevention of contamination of the vulva and vagina of children with the vulvovaginal discharges of other persons, whether by fingers, thermometers, or other means.

Supervision of child-caring institutions and enforcement of scrupulous cleanliness and rigid sanitary precautions to avoid introduction and spread of infection.

Provision of adequate diagnostic facilities, including laboratory facilities for identification of the causative organism by microscopic examination and cultural methods.

Provision of facilities for the prompt and adequate treatment of infected persons with an appropriate chemotherapeutic agent or other recommended drug.

Public education as to the nature of gonorrheal and other forms of vulvovaginitis in children, their mode of transmission and in personal cleanliness and hygiene.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

See section "Venereal Diseases" for control of gonorrheal vulvovaginitis.

YAWS

(Frambesia)

Recognition of the disease

The initial lesion, in the form of a granuloma or papule, is located extragenitally, usually on the legs, and is often engrafted upon a preexisting wound or ulcer. In from one to three months, widespread lesions of the skin develop. The first generalized lesion may be in the form of a furfuraceous desquamation as though the skin had been dusted with flour, but soon characteristic raspberry-like lesions appear. Bone and joint pains are common, and bone lesions are frequently observed. The constitutional symptoms are mild and of little diagnostic value. Among the most common lesions are those on the soles of the feet, giving rise to the condition known as "crab yaws" because of the difficulty and manner of the patient's locomotion. The course of the disease is chronic, and relapses are common. The blood Wassermann reaction and related tests become positive soon after the appearance of the initial lesion and remain positive for many years unless affected by treatment.

Etiologic agent

Treponema pertenue.

Source of infection

Discharges from skin lesions and mucous membranes.

Mode of transmission

Direct contact with lesions of patient and by nonbiting flies which convey the discharges of infected persons to others.

Incubation period

Three and one-half weeks (experimental) to three or more months.

Period of communicability

As long as the lesions are open and there are moist discharges.

Susceptibility and immunity

There is no racial immunity but Negroes are more commonly affected than whites; children and young people more than adults. Recovery from an attack does not result in immunity to reinfection. It is neither congenital nor hereditary.

Prevalence

Very common in the tropics, especially in Africa, Polynesia, the Philippines, and some parts of the Western Hemisphere. In the West Indies more prevalent in some villages than others. At present not known as indigenous in continental North America. Especially prevalent in the Caribbean area: Jamaica, Haiti, Trinidad, Antigua, and other islands of the Leeward group, and some coastal and valley settlements of Colombia.

The Infected Individual, Contacts, and Environment

Methods of control

Recognition of the disease by clinical signs and symptoms and serologic tests.

Isolation: Not practicable.

Concurrent disinfection: Protection of all sores and lesions in endemic locality and disinfection of soiled dressings.

Terminal disinfection: None.

Quarantine: None.

Immunization: None.

Investigation of source of infection: In indigenous areas local surveys of prevalence should be made, range of prevalence determined, and cases in early stages sought for, especially in children.

General Measures

Free clinics, laboratory service, and arsenicals for diagnosis and treatment.

Information service for physicians, patients, and public.

Promotion of adequate personal prophylaxis.

Education in schools, clinics, clubs, etc., as to methods of spread, prevention, and treatment.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

Services available

Serologic tests using syphilitic antigen.

Collection of specimens

Five cc. of whole blood collected in vial and mailed as for Wassermann tests, clearly labeled to indicate condition suspected.

Interpretation of results

Positive serologic tests are encountered in yaws, as well as in syphilis. The test does not differentiate between the two diseases.

Negative report: Negative serologic test.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

Not reportable in California. No control need be exercised over case or contacts.

YELLOW FEVER

Recognition of the disease

Clinical diagnosis is difficult and uncertain. Typical cases are characterized by sudden onset with fever, prostration, headache, back-ache, congestion of the mucous membranes, and mild albuminuria. After two to three days albuminuria becomes pronounced, the pulse rate may become markedly low in relation to temperature, epigastric distress, vomiting of altered blood, buccal and nasal bleeding often occur, and moderate jaundice appears. Leucopenia is the rule. The disease is of short duration. In severity, yellow fever ranges from an almost inapparent febrile reaction of a few hours' duration to the overwhelming infection and intoxication of the classical case. For certain diagnosis, one or more laboratory methods must be employed. These consist of (1) isolation of virus from blood, (2) demonstration of immune bodies in convalescent serum, when absent in the acute phase, and (3) examination of specimens of the liver.

Etiologic agent

A specific filterable virus.

Source of infection

The blood of infected persons, monkeys, marmosets, and probably some other wild animals.

Mode of transmission

By the bite of infected *Aëdes aegypti* mosquitoes and of a number of bush mosquitoes of which *Hemagogus* appears to be the most important in South America. (It is not yet certain that some other biting insect may not be capable of acting as the transmitter.)

Incubation period

Three to six days, rarely longer.

Period of communicability

Two days prior to onset of fever and first three days of fever, possibly four. High degrees of communicability where infected mosquitoes abound and there are many susceptible persons. *Aëdes aegypti* is infectious for susceptible persons beginning 10 to 21 days after biting an infected person (four or five days if kept at 37 degrees C. (98.6 degrees F.)) and presumably remains infectious throughout the life of the insect.

Susceptibility and immunity

Recovery from an attack of the disease is regularly followed by immunity, apparently for life. There is no natural immunity. Brief artificial immunity may be developed by the use of convalescent serum. Active immunity is developed within 10 days by the inoculation of living virus modified by tissue culture (17D strain). The duration of this immunity is considered to be about four years and possibly longer.

Prevalence

Not known in the Pacific Basin. No case in North America or Puerto Rico for many years. Endemic among human beings and some animals of western and central Africa. Endemic in certain species of monkeys (and perhaps other jungle animals) of northern and central South America, and probably in eastern Panama. Occasional epidemics among human beings; the infection transmitted in towns by *A. aegypti* and in the bush by other mosquitoes; sporadic human cases, probably of jungle origin.

Methods of control

The Infected Individual, Contacts, and Environment

Recognition of the disease and reporting: Diagnosis by laboratory tests.

Concurrent disinfection: None, except for the purpose of destroying mosquitoes in the house occupied by the patient and in the nearest neighboring dwellings.

Terminal disinfection: None.

Investigation of source of infection: Human carriers are not known to exist. In endemic areas a sample of blood for a yellow fever immunity test should be taken from all persons suffering from an undiagnosed fever, and if the cause of the fever remains doubtful and the patient recovers, a second sample should be collected at the end of the third week from the onset of the illness. Search for undiscovered mild and unreported cases of illness resembling yellow fever, examination of viscerotome specimens of liver from bodies of persons dying less than 10 days after onset of an acute febrile illness, and systematic testing of immunity in groups related in time and proximity to the case in question are of epidemiologic importance. Search for the *A. aegypti* mosquito and other species believed to be capable of transmitting the infection should be particularly thorough in the vicinity of residence and place of work of known cases of the disease.

General Measures

In regions where yellow fever is suspected, vicerotome service should be organized on a permanent basis to collect liver specimens from fatal cases of febrile illness of short duration. Immunity surveys by mouse protection test are also useful to discover endemic areas.

Control of *Aëdes aegypti* breeding is the most important factor in the prevention of urban outbreaks of yellow fever and should be undertaken in the towns and cities in countries in which the disease prevails endemically.

Immunization of exposed populations is the only feasible method of controlling jungle yellow fever.

Immunization

Who should be immunized

Immunization is practical only for persons who will be exposed to unusual risks of infection and persons entering endemic areas. In the event of an outbreak in California, consult the State Department of Public Health by telephone.

Administration

Immunizing agent: Immunity is quickly conferred by a single injection with an attenuated strain of living virus, 17D. Immunity develops as early as four days after inoculation and apparently lasts for four years or longer. The United States Public Health Service will immunize persons who are expecting to enter endemic areas.

Reactions

Mild local reactions may occur.

Laboratory Diagnosis

Division of Laboratories
3093 Life Sciences Building, Berkeley 4, California

No diagnostic services available at present at the Division of Laboratories. Special serologic tests and other virus studies are done at a few laboratories throughout the country. Services available

Consult the Division of Laboratories for information concerning submission of specimens.

REGULATIONS OF CALIFORNIA STATE BOARD OF PUBLIC HEALTH

SECTION 2640. (a) The patient shall be kept in a mosquito-free room satisfactorily screened against mosquitoes. The isolation period shall be four days after the onset of the fever. Case

(b) Contacts shall be kept under observation for a period of seven days after the date of last exposure. Contacts

Public Health Nursing Responsibility

Teach content included in above sections.

Teach attendant to observe and report to physician signs of blood in the stool or vomitus of patient.

APPENDIX

PART I

DEFINITIONS

From The American Public Health Association Report: "The Control of Communicable Disease"

1. *Carrier*—A person who, without apparent symptoms of a communicable disease, harbors and disseminates the specific micro-organisms.

2. *Cleaning*—The removal by scrubbing and washing, as with hot water, soap, and washing soda, of organic matter on which and in which bacteria may find favorable conditions for prolonging life and virulence; also the removal by the same means of bacteria adherent to surfaces.

3. *Communicable period*—The period or periods during which the etiologic agent may be transferred directly or indirectly from the body of the infected person to the body of another person.

In some diseases such as diphtheria and scarlet fever, in which mucous membranes are involved from the first entry of the pathogen, the period of communicability should be considered to be from the date of first exposure to a source of infection until the infecting organism is no longer disseminated from the involved mucous membranes; i.e., from before the prodromata until the termination of a carrier state if such develops.

In some diseases such as tuberculosis, syphilis, and gonorrhea, the communicable condition may be at any time over a long period when unhealed lesions of the disease permit the discharge of the infecting organisms from the surface of skin or through any of the body orifices. In certain diseases communicability does not occur during the early incubation period or after full recovery; e.g., measles and chickenpox.

In some diseases such as malaria and yellow fever transmitted by insects the period of communicability is that period during which the etiologic organism is found in the peripheral blood of the infected person in infective form.

4. *Contact*—A "contact" is any person or animal known to have been in such association with an infected person or animal as to have been presumably exposed to infection.

5. *Contamination*—Contamination of a surface (wound) or article (handkerchief) or matter (water or milk) implies the presence of a certain amount of undesirable substance or material, which may contain pathogenic micro-organisms.

6. *Delousing*—The process by which a person and his personal apparel are treated so that neither adults nor the eggs of *Pediculus humanus* survive.

7. *Disinfection*—Destruction of the vitality of pathogenic micro-organisms by chemical or physical means directly applied.

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When the word "concurrent" is used as qualifying disinfection, it indicates the application of disinfection immediately after the discharge of infectious material from the body of an infected person, or after the soiling of articles with such infectious discharges, all personal contacts with such discharges or articles being prevented prior to their disinfection.

When the word "terminal" is used as qualifying disinfection, it indicates the process of rendering the personal clothing and immediate physical environment of the patient free from the possibility of conveying the infection to others, at the time when the patient is no longer a source of infection.

8. *Disinfesting*—Any physical or chemical process by which insects [1] or rodents known to be capable of conveying or transmitting infection and living on the body or in and around human habitations may be destroyed upon the person, or his clothing, or in his environment.

9. *Education in personal cleanliness*—This phrase is intended to include all the various means available to impress upon all members of the community, young and old, and especially when communicable disease is prevalent or during epidemics, by spoken and printed word, and by illustration and suggestion, the necessity of:

a. Keeping the body clean by sufficiently frequent soap-and-water baths.
b. Washing hands in soap and water immediately after voiding bowels or bladder and always before eating.
c. Keeping hands and unclean articles, or articles which have been used for toilet purposes by others, away from mouth, nose, eyes, ears, and genitalia.
d. Avoiding the use of common or unclean eating, drinking, or toilet articles of any kind, such as towels, handkerchiefs, hairbrushes, drinking cups, pipes, etc.
e. Avoiding close exposure of persons to spray from the nose and mouth, as in coughing, sneezing, laughing, or talking.

10. *Fumigation*—Any process by which the destruction of insects, as mosquitoes, fleas, bedbugs, and body lice, and animals as rats, is accomplished by the employment of gaseous agents.

11. *Incubation period*—The time interval between the infection of a susceptible person and the appearance in him of symptoms of the disease in question.

12. *Infected person*—Infected persons include patients or sick persons, persons with subclinical or inapparent infection, and carriers.

13. *Infection*—The entry and multiplication of the particular pathogen in the body of man or animal. The presence of living pathogenic organisms on hands or other parts of the skin, or upon articles of human use as apparel or toilet articles, is not infection, but soiling of such surfaces and articles. The term "infection" should not be used to describe conditions of inanimate matter such as soil, water, sewage, milk, or food which are described under the term "contamination."

[1] The term "insects" is used throughout this report to include ticks and mites as well as mosquitoes, fleas, flies, etc.

14. *Infested persons or animals, articles or premises—*

a. By infestation of persons and animals is meant the lodgment, development, and reproduction of insects on the surface of the body or in the clothing.
b. Infested articles or premises are such as harbor or give shelter to insects or rodents capable of carrying disease.

15. *Isolation* *—The separation for the period of communicability of infected persons from other persons, in such places and under such conditions as will prevent the direct or indirect conveyance of the infectious agent from infected persons to other persons.

It is considered necessary to require strict isolation of the patient for the period of communicability and to quarantine or immunize contacts in certain diseases, notably smallpox. However, in some other diseases, such as poliomyelitis, isolation of the patient has but little apparent effect in limiting the spread of the disease, and the period of communicability is not known with reasonable accuracy in any given case.

In diseases of this latter sort the patient must be regarded as a potential source of infection and suitable precautions must be taken, even if these barriers to transmission of the disease are but partially effective. Uncertainty as to the exact duration of the period of communicability does not justify neglect of reasonable isolation measures but rather adds to our obligation to educate patients, the family, and the attending physician in the advantages to be had from separating the sick from the well, and in taking precautionary measures voluntarily when the presence of a communicable disease is suspected and before a diagnosis is established, after the official period of isolation is past, and generally during the epidemic prevalence of such diseases in the community.

When the term "isolation" is used in connection with such diseases as the common cold, influenza, chickenpox, and mumps, it is not to be understood that the establishment of isolation is, under ordinary circumstances, a necessary or practicable procedure for official requirement or enforcement, but a practice to be instituted under the direction of the attending physician, and its duration to be generally, if not exclusively, at his discretion.

Isolation of a patient with a communicable disease from visitors is often of benefit to the patient by reducing the likelihood of additional and complicating infections, as well as a protection to others; quiet, freedom from excitement and fatigue of visits, and complete rest are important factors in the medical and nursing management of such patients and directly contribute to recovery.

16. *Patient or sick person*—A person suffering from a clinically recognizable attack of a communicable disease.

17. *Placarding**—This official procedure under local or State authority consists of posting a warning notice upon the door or entrance to living quarters of persons isolated because of communicable disease. The object of such placarding is primarily to keep unauthorized persons from entering upon the premises during the period of communicability

* These are APHA recommendations. For existing California requirements, see Health and Safety Code, Division 3, Chapter 6, and the regulations of the State Board of Health for the control of specified diseases.

of the isolated patient. Such placarding may incidentally protect the patient against additional or secondary infection which may be carried to him by visitors. Its use may have some educational value.

Placarding, however, does not aid significantly the efforts of a health department to control the acute communicable diseases ordinarily spread directly from person to person in the United States (chickenpox, mumps, pertussis, measles, diphtheria, scarlet fever, anterior poliomyelitis, meningococcus, meningitis, pneumonia, typhoid fever, gonorrhea, syphilis) and consequently is not recommended for these diseases.

Placarding has definite disadvantages: It is difficult to enforce, it may be a deterrent to reporting, it is costly in transportation. The most serious objection is the loss of time of public health nurses and other public health department employees which should be devoted to practical instruction in the observance of isolation and concurrent disinfection at the bedside of patients suffering from the more serious of the communicable diseases.

18. *Quarantine**—By quarantine is meant the limitation of freedom of movement of such susceptible persons or animals as have been exposed to communicable disease for a period of time equal to the longest usual incubation period of the disease to which they have been exposed.

19. *Report of a disease**—By report of a disease is meant the immediate notification, preferably by telephone to the proper health or sanitary authority and, in the case of communicable disease in animals, also to the respective department of agriculture or livestock sanitary authority which has immediate jurisdiction, that a case of communicable disease exists or is suspected of existing in a specified person or animal at a given address.

Each administrative health jurisdiction will ordinarily determine what diseases should be reportable, according to their prevalence or their practical importance from the points of view of the administrator, the epidemiologist, and the statistician.

It is expected that local or state regulation will require the reporting to the appropriate health authority of any unusual or group expression of illness which may be of public concern whether or not known to be or suspected of being communicable in nature, regardless of its absence from the table of contents.

20. *Segregation*—This term applies to the separation for special consideration, control, or observation of some part of a group of persons from the others to facilitate the control of some communicable disease, particularly for the purpose of separating susceptible from immune persons.

21. *Subclinical or inapparent infection*—A person with a subclinical or inapparent infection is one whom the infecting organism, following the period of incubation, affects in so mild or atypical a manner that even though the infection is present it is likely to be unrecognized.

22. *Susceptible*—A "susceptible" is a person or animal that is not known to have become immune to a particular disease by natural or artificial process.

* These are APHA recommendations. For existing California requirements, see Health and Safety Code, Division 3, Chapter 6, and the regulations of the State Board of Health for the control of specified diseases.

23. *Suspect*—A person whose medical history and symptoms suggest that he may now have or be developing a case of some communicable disease. Verification of the suspicion awaits the establishment of the diagnosis by clinical observation and laboratory procedures.

24. *Vector*—A biting insect or arthropod which conveys the pathogenic organism from a person or an animal to another person or animal. The conveyance may be merely by contact with the skin or mucous membrane of the person or by inoculation of the pathogenic matter into or through some part of the skin or mucous surface in the course of biting the person. Mosquitoes, fleas, ticks, mites, flies, may play the role of vectors of various communicable diseases.

25. *Vehicle of transmission*—Matter, usually inanimate, in or upon which pathogenic organisms are present and survive until there is physical contact with, or ingestion occurs in, a person or persons. Body discharges, including blood, pus, saliva, urine, feces, may contain such pathogenic organisms. Hands, eating and toilet articles, water, air, sewage, milk, other foods, and clothing may be the vehicles of transmission.

PART II

PUBLIC HEALTH NURSING PROCEDURES IN COMMUNICABLE DISEASE CONTROL

The public health nurse occupies a unique and important place in the control of the communicable diseases. Much of the actual application of method and procedure referred to in this bulletin is her special concern. Also to her, in large part, falls the opportunity of teaching modern methods of communicable disease control in the home and community. The following sections include supplementary material prepared for public health nurses by public health nurses.

Acknowledgement for valuable assistance in the preparation of this section is made to the Committee on Techniques and Procedures appointed by the Northern California Supervisors and Directors of Public Health Nursing, and to the Public Health Nursing staff of the Pacific Area Office of the American Red Cross.

The Public Health Nursing Bag

Contents of Bag

1. Tube of shaving soap.
2. Rectal thermometer, oral thermometer and cases.
3. Cotton.
4. Forceps and hemostat.
5. Scissors.
6. Tube of vaseline or other lubricant.
7. Apron in case or folded in a paper towel.
8. Tongue blades.
9. Applicators.
10. Sterile flat dressings.
11. Small roll of wet-proof adhesive.
12. Paper towels.
13. Flashlight.
14. Paper bags.
15. Records and literature may be kept in space outside of bag lining.
16. Agency policy will dictate other articles to be included.

Bag Technique

1. Select a convenient field for placing and opening the bag. This should be:
   a. Near running water if possible.
   b. On a stable work surface with sufficient cleared space.
   c. Set-up outside of the patient's room. If this is not possible, must be at least six feet away from the patient to minimize contamination by droplet infection.
   d. Inaccessible to small children and animals.
2. Place bag on newspaper.
3. Remove coat and hat. Fold coat outside out and place on plain chair away from wall. Use newspaper on the chair as protection in case of communicable disease. Leave coat outside patient's room, or if impossible, at least six feet from patient.

4. Roll sleeves to elbows, if long sleeves are worn. Open bag. Remove three paper towels, tube of soap, and paper bag.
5. Open one paper towel and place on newspaper near bag to provide clean field. Place other towels on this. Remove watch and place in pocket or on clean field. Stand paper bag to side of clean field.
6. Squeeze some of soap on left hand. Squeeze additional daub on corner of paper towel surface.
7. Wash hands under running water and dry with paper towel. When running water is not available, have water poured over hands.
8. Dry hands with one paper towel. Place used paper towel in paper bag.
9. Remove apron, returning case to bag. Put on apron with clean side (the side folded out) next to dress.
10. Remove all articles to be used for visit and place them on paper towel.
11. Close bag. Should it be necessary to take out other articles after starting care of patient, wash hands before reopening bag.
12. Wash hands and replace articles in bag after completing care. Apron is folded clean side out. In communicable disease visit, apron is not returned to the bag, but carried in separate wrapper.
13. Remove record and literature from bag if this is agency policy. Record the visit and return record to bag.
14. Remove bag from set-up. Wrap all refuse in the newspaper and make sure that it is burned or otherwise disposed of without further handling.

Thermometer Technique

1. The effectiveness of this technique is dependent on vigorous cleansing of thermometer with adequate soap and friction.
2. The rectal and mouth thermometers should be kept in their respective cases. Mark the rectal thermometer and case.
3. Follow bag technique.
4. Equipment:
   a. Mouth thermometer.
   b. Two soapy cotton pledgets and three dry cotton pledgets.
   c. Extra cotton pledgets if needed for rinsing.
5. Procedure for mouth temperature:
   a. Rinse thermometer under running cold water.
   b. Place in mouth and leave three minutes.
   c. Remove the thermometer. Wipe downward with first dry cotton pledget. Read. With the same piece of dry cotton hold the thermometer at bulb end.
   d. Pick up soaped cotton pledget. Starting at top, wipe downward using a spiral rotary motion, as far as the dry pledget, using friction, and cleansing well into the grooves.
   e. Holding the thermometer at the bulb end with the first soapy pledget, discard dry pledget and pick up second clean, dry pledget and use it to hold the thermometer at the top. Continue cleansing bulb of the thermometer and discard soapy pledget.

f. Starting at the top, just below the dry pledget, repeat wiping with second soapy pledget and discard.
g. Rinse thermometer thoroughly under running water, or use clean cotton pledget soaked with water and rinse over a basin or sink.
h. Dry thoroughly with additional cotton pledget and return thermometer to the case.

6. Technique for rectal temperature:
   a. Equipment:
      1. Rectal thermometer.
      2. Two soapy cotton pledgets and three dry cotton pledgets.
      3. Extra cotton pledgets if needed for rinsing.
      4. Vaseline or other lubricant.
   b. Technique:
      1. Apply lubricant to thermometer with cotton or toilet tissue.
      2. Insert and hold for three minutes.
      3. Remove the thermometer, wipe, read, and use same cleansing technique as for mouth thermometer. If running water is available only at kitchen sink, rinsing is done with water-soaked cotton pledgets over the toilet bowl or other waste receptacle.

Procedures and Teaching Responsibilities of the Nurse in All Cases of Communicable Diseases

1. Use as much of the family's equipment as possible. Remove from bag only articles that can be sterilized or properly washed or discarded.

2. Assemble all articles before entering patient's room. Complete care before leaving the room. This practice will demonstrate verbal teaching.

3. The attendant must be taught to wear a large apron and use it only for giving care to the patient. Help attendant to select a suitable apron. Teach her to keep it on a hook or hanger in the patient's room.

4. The attendant must be taught to wash her hands and dry them thoroughly before and after touching the patient, and before touching anything outside the sick room. Help her to arrange a hand-washing unit if necessary. Teach her how to wash hands between fingers and around cuticle, as well as flat surfaces using friction.

5. If a nurse is caring for patients with streptococcal infections, including scarlet fever and erysipelas, she should avoid carrying concurrently post-partum and surgical cases and patients with debilitating diseases. If it is necessary for her to care for both types of cases, visits to those with streptococcal infections should, if feasible, be made last in the day. The greatest protection comes through the use of good technique in all visits.

Procedures and Teaching Responsibilities of the Nurse in Specific Cases of Communicable Disease

When one or more of the following procedures is required for a specific disease, it will be so stated under the heading of that disease.

Disposal of nose and throat discharges: Teach that burning is the safest means of disposing of nose and throat discharges. A paper bag

at the bedside is the best way to collect discharges so that only the patient will handle them. Cleansing tissue, toilet paper, or old clean cloths should be used by the patient for coughing, spitting, or sneezing. If burning of discharges is impossible, wrap and tie the bag containing discharges in a secure package, mark "contaminated" and put in the garbage. Nose and throat discharges collected on toilet paper or cleansing tissue may also be disposed of by flushing down the toilet.

Disposal of dressings: Teach that burning is the safest means of disposal of soiled dressings. If burning is impossible, wrap and tie in a secure package, mark "contaminated" and put in garbage.

Disposal of uneaten food: Teach that dishes of the patient are scraped and uneaten food particles collected and burned. If burning is impossible, wrap and tie in a secure package, mark "contaminated" and put in garbage. Uneaten soft or liquid food particles left on contaminated dishes may be disposed of by flushing down the toilet.

Care of dishes: Teach that dishes must be washed in *hot* soapy water, using friction on rims of glasses and cups, flat surfaces of plates, each tine of the forks, edges and bowls of the spoons, etc. They must then be placed in a rack exposing all surfaces and scalding water poured over them. It is preferable that they be air dried.

Care of linen: Teach that soiled linen must be soaked in soapy warm water immediately. This prevents development of odors, further use, and handling. It is then washed as soon as possible. Ordinary washing with friction and drying will kill most pathogens.

Disposal of excreta: Feces and urine may be put into flush toilets or septic toilets without treatment. Disinfection of excreta is imperative where the disposal facility is a privy. Preparation of disinfectant: Four ounces chloride of lime, two gallons water. (*Caution:* Do not allow this to splash into eyes while mixing.) This liquid will produce a strong characteristic chlorine odor. Completely mascerate feces to permit thorough contact with solution. Pour entire two gallons of solution on the feces and urine and allow to stand for 30 minutes. If during this time, the characteristic odor of chlorine disappears add two more ounces of dry powdered chloride of lime and let stand another 30 minutes. Discharges are then dumped into the privy pit or buried.

Terminal disinfection: Teach the attendant that soap and hot water with friction, air and sunshine are the best disinfectant because pathogens die when dried and when friction is used combined with soap.

a. Use hot water and soap with friction on everything possible in the patient's room.
b. Other articles such as mattresses, blankets, toys, books, should be aired in sunshine for six hours. After airing, soiled articles may be sent to the cleaner.
c. The patient's room should be stripped first, then aired for several days.
d. The patient should be bathed and dressed in clean clothes.

Technique for Taking Eye Smear

Equipment:

1. Two clean glass slides.
2. Rubber band.

3. Laboratory slip.
4. Cotton applicator, sterile.
5. Waste bag.

Procedure:

1. Be sure all equipment is available.
2. Wash hands well before and after taking smear.
3. With thumb and first finger of one hand, hold eye open. With sterile applicator in other hand, swab over the surface of the lid where discharge is in evidence.
4. Draw applicator over the surface of the slide.
5. Allow slide to dry.
6. Cover with second slide.
7. Wrap in properly filled out laboratory slip and secure with rubber band.
8. Send to laboratory in protective container.

Technique for Taking Nose and Throat Cultures for Diphtheria

Equipment:

1. Tongue blade.
2. Test tube with two sterile swabs.
3. Test tube with diphtheria media.
4. Laboratory slip.
5. Flash light.
6. Rubber band.
7. Waste bag.

Procedure:

1. Complete data on laboratory slip.
2. Wash hands well before and after taking cultures.
3. Make thorough inspection of throat before taking culture. Determine places where infection is most severe.
4. Have attendant or member of family hold flash light in proper position.
5. Remove one sterile swab, depress tongue, swab gently over white spots or inflamed area on tonsil or uvula.
6. If swab is to be applied to media, hold media tube so moisture rises over slant surface. Rotate the swab between thumb and forefinger as it slides back and forth over the media. Press swab glass inside of the tube to express excess moisture. Remove swab and put in waste bag to be burned.
7. If culture is to be planted on media in the laboratory, swab throat as in 5 above and then reinsert contaminated throat swab into the container.
8. Use second clean swab for nasal culture. Apply same swab to both nostrils gently, and insert to nasal pharynx. If much nasal discharge is present, have patient blow nose before taking culture.
9. Replace swab in container, or plant on same media as throat culture unless otherwise instructed. Proceed as described above.
10. Wrap laboratory slip around labelled tube and secure with rubber band.

11. Prevent contamination of cork or plug of test tube containing swab or media.
12. Take or send to laboratory as soon as possible. If specimens are to be sent parcel post, *swabs*, not cultures, are preferred for the following reasons:
    a. Media often breaks up in transit.
    b. Growth of contaminating organisms may suppress growth of diphtheria bacillus.

Collection of Stool and Urine Specimens for Typhoid Fever Cases, Carriers, and Contacts

Equipment:

1. Laboratory mailing tube with inside protective container holding one feces bottle with wooden stick, and one urine specimen bottle. Both bottles contain a glycerine solution which preserves the specimen.
2. Laboratory slip.
3. Clean bed pan or substitute.

Procedure:

1. Patient should take a cathartic the night before specimen is to be collected. Epsom salt is first choice since it empties the gall bladder. No cathartic is necessary if a diarrhea exists. Never give cathartic to a case without written order from doctor.
2. Wash hands well before and after taking specimen.
3. Remove specimen bottles from container and have them handy.
4. Collect urine specimen in clean bed pan or substitute.
5. Fill bottle for urine specimen about three-quarters full, replace cover tightly, and insert in protective container.
6. Collect feces specimen in clean bed pan or substitute. The specimen should be collected from the *second stool* after cathartic is given.
7. With wooden stick provided, scoop up amount equal to one-quarter teaspoon of soft part of feces and drop feces and stick into glycerine solution in bottle marked feces.
8. Replace cover tightly and insert bottle in protective container.
9. Pad top and side of protective container, cover tightly, and replace in mailing tube.
10. Fill out laboratory slip completely and insert it in mailing tube.
11. Pad inside of mailing tube and cover tightly.
12. See that mailing tube is properly addressed and stamped; then mail immediately.

* * * * * * *

Be certain that the family understands the above instructions.

Collection of Sputum Specimens for Tuberculosis Diagnosis

Sputum is material coughed up from the lungs. Purulent, cheesy, and muco-purulent sputum most frequently contains the bacilli. Pure mucus, blood and saliva less frequently contain the bacilli.

Equipment:

1. Laboratory slip.
2. Sputum bottle and container.

Procedure:

1. Patient should brush teeth, rinse mouth and throat, and wash hands before going to bed at night.
2. Keep the outside of the sputum bottle from being contaminated with sputum. The sputum bottle should never be filled more than half full.
3. Patient should cough up the sputum from the lower air passages and collect it in sputum bottle the first thing after he awakens in the morning.
4. If expectoration is scanty, collect the entire amount discharged in 24 hours. Brush teeth and rinse mouth and throat with plain water after eating—to avoid contamination of specimen with food particles.
5. Cap sputum bottle tightly.
6. Patient should wash hands after collecting specimen.
7. Fill out laboratory slip; label and place in container—put on stamp and mail immediately to the laboratory.
8. Use sputum container provided by the laboratory to which specimen is being sent for examination.

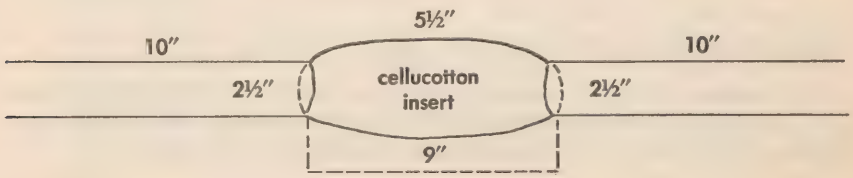
Recommendation:

It should be routine for the nurse to carry laboratory sputum bottles, containers and slips with her at all times. In an emergency, if no laboratory container is available and nurse wishes to collect specimen as part of a field visit, a wide mouthed, 3-ounce, clean glass jar with a metal screw top is satisfactory.

Preparation and Use of Masks

Use bleached cheesecloth No. 130 which comes in a roll 18 inches wide, folded double. Cut a 6-inch strip off the double cheesecloth roll, in order to have a double piece of material 18 inches long and 6 inches wide with selvages on one side and a fold on the other. Turn in one-quarter inch on each of the two raw edges. Fold the material in half from end to end. Gather the 6-inch sides until they are $2\frac{1}{2}$ inches across. Cut two pieces of tape 29 inches long and bind the sides, leaving 10 inches at each end for ties.

A 5-inch space for insert of four thicknesses of cellucotton is left in the center of the mask. The cellucotton insert is put between the double thickness of cheesecloth. The stitching through the mask holds the cellucotton in place.



When to wear a face mask: As specified for the communicable diseases, psittacosis, plague, tuberculosis.

When to discard a mask as soiled:

When leaving an isolation room.
When the mask is damp.
When the mask is removed.
When the attendant has completed care.

How to care for mask: Soiled mask should be removed by holding on to the string. Drop soiled mask into a paper bag if it cannot be washed immediately. Remove filter, drop mask into soapy hot water and wash it. When mask is dry, insert fresh cellucotton and store in a clean place for future use.

PART III

DDT (DICHLORO-DIPHENYL-TRICHLOROETHANE)

Its Use in the Control of Human Lice and Scabies

Infestation of humans by lice *(Pediculus humanus* or *Phthirus pubis)* and by the itch mite *(sarcoptes scabei)* has long been a troublesome problem to both public health authorities and school administrators. Recently, the introduction of DDT has materially altered the concept of control of these infestations. Undoubtedly, further revision in materials and methods will be forthcoming but for the present the following paragraphs may be of assistance. The data presented are based on correspondence with the United States Department of Agriculture, the United States Army, the United States Navy, the New York State Department of Health, the Michigan Department of Health and the American Medical Association.

Head Lice

The head louse *(P. humanus humanus)* may be acquired easily through exchange of hats, brushes, combs, and from such places as infected beds, streetcars and buses. Because of the ease of spread, head lice are often found among school children.

The female louse glues 50 to 150 eggs to the hair, where they hatch in 5 to 10 days. The developmental cycle from egg to egg requires about three weeks.

When infestation of school children is suspected, head inspections should be made by the school nurse. DDT may be applied by her upon the direction of a physician. It is advisable to secure written consent from the parent prior to the application of DDT. Children under treatment and observation may be permitted to continue in school.

Method I—The use of a DDT dusting powder is especially applicable to individuals in homes or to small groups of school children. The following mixture should be prepared by a pharmacist:

10 Percent DDT Dusting Powder

DDT	10 parts by weight
Pyrophyllite (or powdered talc)	90 parts by weight

Prior to applying the dusting powder, the hair should be well shampooed to remove as much of the natural oil as possible. The hair should then be allowed to dry completely, after which the dusting powder is thoroughly and uniformly applied in such a manner as to penetrate to the scalp. Rubbing is usually necessary. A dusting can or small atomizer may be of assistance. Care should be exercised to prevent the dusting powder from entering the eyes.

The head should not be shampooed for at least 48 hours after DDT powder has been applied. If possible, keep the powder on the head for a longer time to prevent reinfestation and to kill the young lice on hatching from the eggs. DDT does not destroy ova. Dead lice may be removed on the following day by combing the hair with a Derbac comb. A second application of DDT dusting powder 10 days after the first is recommended. Newly hatched lice are killed before they have time to lay eggs.

A follow-up visit to the home, with appropriate inspection and DDT dusting of other members of the child's family may prevent subsequent reinfestation.

Hats and other headgear should be dusted with DDT powder where indicated.

Method II—The use of DDT in an emulsion is applicable where large numbers of children are to be treated. The following emulsion concentrate should be prepared by a pharmacist:

DDT Emulsion Concentrate

Benzyl benzoate	68 parts by weight
DDT	6 parts by weight
Benzocaine (or ethyl p-amino benzoate)	12 parts by weight
Tween 80 (emulsifying agent)	14 parts by weight

Dilute this concentrate one part to five parts of water before using. It is noninflammable.

Apply by sprayer or by hand depending upon the number of persons and equipment available. Two to four teaspoonfuls is needed per individual depending on the amount of hair. Apply evenly and rub thoroughly into the hair since the eggs must be contacted to be killed. The eyes should be protected. This treatment will destroy all lice and nits within a few hours and will prevent reinfestation for two weeks *if the head is not washed for 48 hours after treatment.* .

Body Lice

The body louse or clothes louse *(P. humanus corporis)* is an important vector of several diseases. It usually spends its life in the clothes of the individual but occasionally lays eggs on the hairs of the body and is known to cling to the host when the clothing is removed. In looking for body louse infestations, one should examine clothing along the seams and folds, especially on the insides of the underwear. Control measures should be directed largely toward the treatment of clothing.

Application to clothing should be made with 10 percent DDT dusting powder (10 percent by weight of DDT in pyrophyllite) applied at the rate of one ounce of the powder to each individual's infested clothing. Application should be made over the entire inner surface of the underwear, with special attention to seams. Seams of other articles of clothing should also receive close attention.

The above method will give a complete kill and protection from reinfestation of the treated clothing for three to four weeks. Although the powder is not ovicidol, newly hatched lice are killed by the residual action of DDT remaining in the treated clothes. The individual is not protected, however, if he changes to untreated, infested clothing. Additional application to the new clothing is then necessary.

Impregnation of garments with DDT (2 percent of the dry weight of the garment) is especially effective and gives a more permanent control of body lice than by the use of dusting powder. Treated garments worn continuously but washed once each week, are effective in eliminating lice for six to eight weeks (longer if not washed). Special instructions may be obtained by addressing a request to the State Department of Public Health or to the United States Department of Agriculture, Bureau of Entomology and Plant Quarantine, Washington, D. C.

Crab Lice

The crab louse *(Phthirus pubis)* may be effectively controlled by the use of a 10 percent DDT dusting powder applied thoroughly and uniformly to all hairy areas of the body. About 10 grams per person per application is required. Since DDT is not ovicidol, the powder must be reapplied following an interval of seven to ten days. The individual should refrain from bathing for at least 24 hours after application.

DDT Emulsion (see formula above) is also effective against crab lice. The diluted concentrate (one part to five parts of water) should be applied thoroughly to all hairy portions of the body and be allowed to remain for 48 hours. Application is best made with a sponge or piece of cotton. One to two ounces per person per application is usually required. Unless all eggs are contacted by the first application, a second treatment will be necessary following an interval of 10 days.

Scabies

Infestation with the itch mite *(sarcoptes scabei)* can be effectively controlled by use of DDT Emulsion (see formula above). The use of this formula is probably more effective than benzyl benzoate used alone. The diluted concentrate (one part to five parts of water) should be applied by means of a sponge to the entire body with the exception of the head. Special attention should be given to lesions which are apparent. Approximately two to three ounces per person per application are required. The treated individual should refrain from bathing for at least 48 hours. In some instances a second application will be required in about seven to ten days.

DDT Precautions

DDT is *not* a nontoxic substance. It is poisonous to warm blooded animals, including humans, when considerable amounts are ingested or absorbed through the skin.

Care must be taken to prevent accidental ingestion by contamination of food since DDT is a white, odorless and tasteless powder, bearing a physical resemblance to flour. It offers no warning upon ingestion. DDT should never be stored with food products.

Dry DDT in concentrated form or when used mixed with inert powders, is not absorbed through the skin, but DDT in oils and organic solvents may be. Therefore, oily solutions of DDT should not be applied to the skin. (Shampooing of heads, particularly oily heads, before application of a DDT dusting powder is referred to in a preceding paragraph.)

Eyes should be protected when DDT is being applied.

For possible toxic effects resulting from the use of DDT in aerosols and by other means of application outside the scope of this publication, reference is made to the extensive literature on this subject.

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